



DEVELOPMENT SERVICES DEPARTMENT
ENVIRONMENTAL COORDINATOR
450 110th Ave NE., P.O. BOX 90012
BELLEVUE, WA 98009-9012

OPTIONAL DETERMINATION OF NON-SIGNIFICANCE (DNS) NOTICE MATERIALS

The attached materials are being sent to you pursuant to the requirements for the Optional DNS Process (WAC 197-11-355). A DNS on the attached proposal is likely. This may be the only opportunity to comment on environmental impacts of the proposal. Mitigation measures from standard codes will apply. Project review may require mitigation regardless of whether an EIS is prepared. A copy of the subsequent threshold determination for this proposal may be obtained upon request.

File No. 13-109929-LO and 13-107282-WE

Project Name/Address: Myhavold Bulkhead Repair
425 Shoreland Drive SE

Planner: Reilly Pittman

Phone Number: 425-452-4350

Minimum Comment Period: April 4, 2013

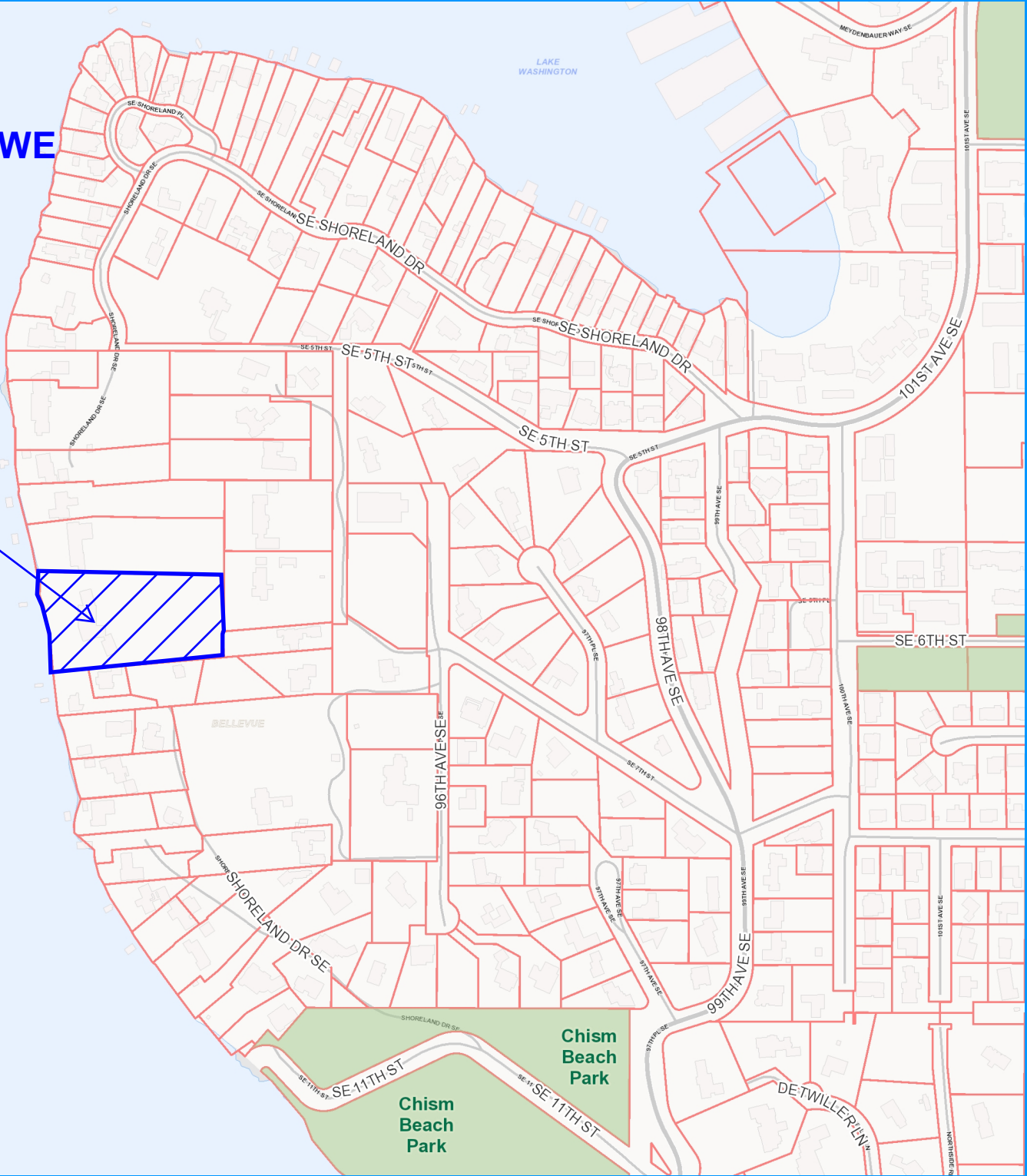
Materials included in this Notice:

- ☒ Blue Bulletin
- ☒ Checklist
- ☒ Vicinity Map
- ☒ Plans
- ☐ Other:

Myhavold Bulkhead Repair

File Number:
13-109929-LO and 13-107282-WE

Project Site
425 Shoreland Drive SE



CITY OF BELLEVUE

DEPARTMENT OF PLANNING AND COMMUNITY DEVELOPMENT

ENVIRONMENTAL CHECKLIST

FEB 20 2013

Permit Processing

Purpose of checklist:

The State Environmental Policy Act (SEPA), chapter 43.21C RCW, requires all governmental agencies to consider the environmental impacts of a proposal before making decisions. An environmental impact statement (EIS) must be prepared for all proposals with probable significant adverse impacts on the quality of the environment. The purpose of this checklist is to provide information to help you and the agency identify impacts from your proposal (and to reduce or avoid impacts from the proposal, if it can be done) and to help the agency decide whether an EIS is required.

Instructions for applicants:

This environmental checklist asks you to describe some basic information about your proposal. Governmental agencies use this checklist to determine whether the environmental impacts of your proposal are significant, requiring preparation of an EIS. Answer the questions briefly, with the most precise information known, or give the best description you can.

You must answer each question accurately and carefully, to the best of your knowledge. In most cases, you should be able to answer the questions from your own observations or project plans without the need to hire experts. If you really do not know the answer, or if a question does not apply to your proposal, write "do not know" or "does not apply." Complete answers to the questions now may avoid unnecessary delays later.

Some questions ask about governmental regulations, such as zoning, shoreline, and landmark designations. Answer these questions if you can. If you have problems, the governmental agencies can assist you.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Use of checklist for nonproject proposals:

Complete this checklist for nonproject proposals, even though questions may be answered "does not apply." In addition, complete the supplemental sheet for nonproject actions (part D).

For nonproject actions, the references in the checklist to the words "project," "applicant," and "property or site" should be read as "proposal," "proposer," and "affected geographic area," respectively.

A. BACKGROUND

1. Name of proposed project, if applicable: **Myhrvold Bank Stabilization (Bulkhead Replacement with Battered Rock and Cove Beach Enhancements).**
2. Name of applicant: **Cameron and Linda Myhrvold**
3. Tax parcel number: **562730 0197**
4. Address and phone number of applicant and contact person:

Applicant:

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EVALUATION FOR
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**Cameron and Linda Myhrvold
425 Shoreland Drive SE
Bellevue WA 98004
425-260-4077**

Contact Person:

**Alan Foltz, Permit Coordinator
Waterfront Construction**

205 NE Northlake Way, Suite 230, Seattle, WA 98105

Ph: 206-548-9800

Fax: 206-548-1022

foltz@waterfrontconstruction.com

5. Date checklist prepared:
May 22, 2012
6. Agency requesting checklist:
City of Bellevue
7. Proposed timing or schedule (including phasing, if applicable):
As permits allow, within authorized work windows. No Phasing.
8. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? **No.** If yes, explain.
9. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.
None known.
10. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain. **None known.**
11. List any government approvals or permits that will be needed for your proposal, if known.
Shoreline SDP Exemption (WAC 173-27-040-2(c) - City of Bellevue
SEPA Determination- City of Bellevue
Building Permit- City of Bellevue
Demolition Permit- City of Bellevue
Hydraulic Project Permit- Washington St. Department of Fish and Wildlife
Section 10 Permit- U. S. Army Corps of Engineers
12. Give a brief, complete description of your proposal, including the proposed uses and the site of the project. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

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Replace the existing deteriorated wood bulkhead, removing 41 +/- 10" to 12" soldier piles and wooden bulkhead, installing a battered rock bulkhead with natural cove beach area containing beach access stairs.

- Restore toe protection and enhance fish spawning with full shoreline placement of -----CY of spawning gravel.

260 cubic
yards of gravel
added per Bio.
Eval.

13. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range

Address:

**425 Shoreland Drive SE
Bellevue, WA 98004**

¼ Section: SE Section: 31 Township: 25N Range: 05E

Directions: **Proceed Eastward on SR520, exiting 84th Ave NE in Medina. Turn right, and proceed south to NE 12th. Name changes to Lk. Washington Blvd. Turn right onto 101st Ave SE. Curve right onto SE Shoreland Drive, and proceed to site at street end.**

Legal Description:

MOORLAND ADD POR OF BLKS 6-7-8 & NLY 40 FT OF BLKS 5 & 10 & OF VAC STS ADJ BEG AT NXN OF C/L OF 94TH AVE SE & N LN OF PLAT TH S 89 DEG 53 MIN 49 SEC W 296 FT TH S 607.13 FT TO TPOB TH S 223.77 FT TH S 84 DEG 49 MIN 08 SEC W 455.22 FT TH S 84 DEG 49 MIN 08 SEC W 6 FT M/L TO SH LN OF LAKE TH NWLY ALG SH LN TO PT S 89 DEG 53 MIN 04 SEC W FR TPOB TH N 89 DEG 53 MIN 04 SEC E TO TPOB & SH LDS ADJ

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TO BE COMPLETED BY APPLICANT:

B. ENVIRONMENTAL ELEMENTS

1. Earth

- a. General description of the site (circle one): Flat, rolling, hilly, steep slopes, mountainous, other: **flat to gentle slope.**
- b. What is the steepest slope on the site (approximate percent slope)? **Steepest slope on the property is approximately 10 to 20% , with yard flat 10 to 15' from bulkhead. See site photos.**
- c. What general types of soils are found on the site (for example, clay, **sand, gravel**, peat, muck)? If you know the classification of agricultural soils, specify them and note any prime farmland. **No prime farmland soils are present.**
- d. Are there surface indications or history of unstable soils in the immediate

vicinity? **None known.** If so, describe.

- e. Describe the purpose, type, and approximate quantities of any filling or grading proposed. Indicate source of fill. **None proposed.**
- f. Could erosion occur as a result of clearing, construction, or use? **No.** If so, generally describe.
- g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)? **The amount of impervious surface will not change.**
- h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any: **Best Management Practices, and a silt floatation curtain will be positioned in the water to contain debris during construction and will be maintained in working order for the duration of construction.**

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2. Air

- a. What type of emissions to the air would result from the proposal (i.e., dust, automobile, odors, industrial wood smoke) during construction and when the project is completed? If any, generally describe and give approximate quantities if known. **During construction, muffled diesel powered equipment exhaust will be present. Once construction is complete, there will be no emissions.**
- b. Are there any off-site sources of emissions or odor that may affect your proposal? **No.** If so, generally describe.
- c. Proposed measures to reduce or control emissions or other impacts to air, if any: **Equipment used at the project site will have muffled exhausts.**

3. Water

- a. Surface:
 - 1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into. **Yes. Lake Washington which flows into the Ship Canal then into the Puget Sound.**
 - 2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? **Yes.** If yes, please describe and attach available plans. **See attached permit drawings.**
 - 3) Estimate the amount of fill and dredge material that would be placed in or

removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material. **No fill or dredge materials. Spawning gravel to be placed for toe protection and spawning enhancement.** *show CO 205*

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known. **No.**

5) Does the proposal lie within a 100-year floodplain? **No.** If so, note location on the site plan.

6) Does the proposal involve any discharges of waste materials to surface waters? **No.** If so, describe the type of waste and anticipated volume of discharge.

b. Ground:

1) Will ground water be withdrawn, or will water be discharged to ground water? **No.** Give general description, purpose, and approximate quantities if known.

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2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any **None.** (for example: Domestic sewage; industrial, containing the following chemicals; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve. **N/A**

c. Water Runoff (including storm water):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe. **Storm water follows existing grade and this will not be changed. The proposed rock bulkhead is non impervious.**

2) Could waste materials enter ground or surface waters? **No.** If so, generally describe.

d. Proposed measures to reduce or control surface, ground, or runoff water impacts, if any: **A filter fabric barrier behind the rock bulkhead allows water drainage through the rock bulkhead while retaining soils behind the bulkhead.**

4. Plants

a. Check or circle types of vegetation found on the site:

✓ **deciduous tree:** alder, maple, aspen,

√ **evergreen tree:** fir, cedar, blue spruce, pine, hemlock, other shrubs

√ **grass**

√ **shrubs**

_ pasture

_ crop or grain

_ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other

_ water plants: eelgrass, milfoil

b. What kind and amount of vegetation will be removed or altered? **None proposed.**

c. List threatened or endangered species known to be on or near the site. **None known.**

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any: **None proposed. Existing grass, rooted trees, and vegetation to be retained and protected.**

5. Animals

a. Circle any birds and animals that have been observed on or near the site or are known to be on or near the site: birds: **hawk, heron, eagle, songbirds**, other: mammals: deer, bear, elk, beaver, other: fish: bass, **salmon, trout**, herring, shellfish, other: **ducks and geese**.

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b. List any threatened or endangered species known to be on or near the site. **Puget Sound Chinook salmon and bull trout, which are federally listed as "Threatened" under the ESA, are known to spawn/migrate in the Lake Washington watershed. Juvenile salmon may use the nearshore waters of the project area. Bald Eagles use Lake Washington for foraging. There are no known spawning areas in the vicinity of the project.**

coho, chinook, bull trout, and steelhead are found in the Lake and described in the Bio. Eval.

c. Is the site part of a migration route? If so, explain. **Juvenile salmonids migrate along the lake shoreline.**

d. Proposed measures to preserve or enhance wildlife, if any:

- **The construction barge will not be allowed to ground out on the lake bottom at anytime.**
- **Construction will take place during authorized state and federal work windows designed to protect listed species at this location on Lake Washington.**
- **A floating, anchored silt screen will be employed to protect the area during construction.**

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6. Energy and Natural Resources

- a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? **None.** Describe whether it will be used for heating, manufacturing, etc.
- b. Would your project affect the potential use of solar energy by adjacent properties? **No.** If so, generally describe.
- c. What kinds of energy conservation features are included in the plans of this proposal? **None.** List other proposed measures to reduce or control energy impacts, if any:

7. Environmental Health

- a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste that could occur as a result of this proposal? **None.** If so, describe.

- 1) Describe special emergency services that might be required.
No requirement for emergency service is anticipated. However, should they be needed, the Washington Department of Ecology, an Emergency Response Cleanup Team, and WDFW will be contacted.

- 2) Proposed measures to reduce or control environmental health hazards, if any: **A hazardous spill management plan will be present on-site. Spill clean-up and containment materials will also be on-site. Included in the clean-up packets will be containment booms, materials designed to absorb petroleum produces, and plastic bags to be used for material transport. No measures to reduce or control hazards are assumed needed or proposed.**

- b. Noise

- 1) What types of noise exist in the area which may affect your project (for example: traffic, equipment operation, other)? **None.**

What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from site. **Construction equipment during permitted working windows will generate exhaust noise during operation. Construction equipment and materials will be transported and operated from the barge.**

- 2) Proposed measures to reduce or control noise impacts, if any:
Construction will be limited to business hours and operation need during the workweek.

8. Land and Shoreline Use

- a. What is the current use of the site and adjacent properties?

Site: Single Family Residence
Adjacent: Single Family Residence

- b. Has the site been used for agriculture? **No.** If so, describe.
- c. Describe any structures on the site.
Structures on the site include an upland single family residence, and a small storage shack near shoreline. A conforming private pier structure projects waterward.
- d. Will any structures be demolished? **Yes.** If so, what? **The Existing wood bulkhead and its soldier piling (44 Piles +/-).**
- e. What is the current zoning classification of the site? **R-1**
- f. What is the current comprehensive plan designation of the site?
Single Family Residential
- g. If applicable, what is the current shoreline master program designation of the site? **Unknown**
- h. Has any part of the site been classified as an "environmentally sensitive" area? **No.** If so, specify.
- i. Approximately how many people would reside or work in the completed project? **N/A.**
- j. Approximately how many people would the completed project displace?
None.
- k. Proposed measures to avoid or reduce displacement impacts, if any: **None.**
- l. Proposed measures to ensure the proposal is compatible with existing and project land uses and plans, if any: **None Proposed.**

R-1.8

Single Family
Low Density

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9. Housing

- a. Approximately how many units would be provided, if any? **N/A** Indicate whether high, middle, or low-income housing.
- b. Approximately how many units, if any, would be eliminated? **N/A.** Indicate whether high, middle, or low-income housing.
- c. Proposed measures to reduce or control housing impacts, if any: **N/A**

10. Aesthetics

- a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed? **The proposed bulkhead and cove area will be at 1' max. above ground level.**
- b. What views in the immediate vicinity would be altered or obstructed? **None.**
- c. Proposed measures to reduce or control aesthetic impacts, if any: **None needed or proposed.**

11. Light and Glare

- a. What type of light or glare will the proposal produce? **None.** What time of day would it mainly occur? **N/A.**
- b. Could light or glare from the finished project be a safety hazard or interfere with views? **No.**
- c. What existing off-site sources of light or glare may affect your proposal? **None.**
- d. Proposed measures to reduce or control light and glare impacts, if any: **None.**

12. Recreation

- a. What designated and informal recreational opportunities are in the immediate vicinity? **Water recreation opportunities at the site include boating, swimming, skiing, and fishing.**
- b. Would the proposed project displace any existing recreational uses? If so, describe. **No.**
- c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any: **None Proposed.**

13. Historic and Cultural Preservation

- a. Are there any places or objects listed on, or proposed for, national, state, or local preservation registers known to be on or next to the site? If so, generally describe. **No.**
- b. Generally describe any landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the site. **None.**

- c. Proposed measures to reduce or control impacts, if any: **None Proposed.**

14. Transportation

- a. Identify public streets and highways serving the site, and describe the proposed access to the existing street system. Show on site plans, if any.
The site is currently accessed by local city streets. All project construction materials and equipment will be transported to site via barge.
- b. Is site currently served by public transit? If not, what is the approximate distance to the nearest transit stop? **N/A.**
- c. How many parking spaces would the completed project have? **N/A.** How many would the project eliminate? **N/A.**
- d. Will the proposal require any new roads or streets, or improvements to existing roads or streets, not including driveways? **No.** If so; generally describe (indicate whether public or private). **N/A.**
- e. Will the project use (or occur in the immediate vicinity of) **water**, rail, or air transportation? If so, generally describe. **Recreational boat traffic on Lake Washington occurs in this area.**
- f. How many vehicular trips per day would be generated by the completed project? If known, indicate when peak volumes would occur. **N/A.**
- g. Proposed measures to reduce or control transportation impacts, if any. **N/A.**

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15. Public Services

- a. Would the project result in an increased need for public services (for example: fire protection, police protection, health care, schools, other)? **No.** If so, generally describe.
- b. Proposed measures to reduce or control direct impacts on public services, if any. **N/A.**

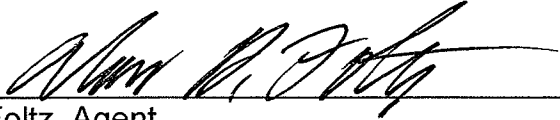
16. Utilities

- a. Circle utilities currently available at the site: electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other.
- b. Describe the utilities that are proposed for the project, the utility providing the service and the general construction activities on the site or in immediate vicinity, which might be needed. **None at bulkhead location.**

C. SIGNATURE

The above answers are true and complete to the best of my knowledge. I understand the lead agency is relying on them to make its decision.

Signature:



Alan Foltz, Agent
Permit Coordinator
Waterfront Construction, Inc.

Date submitted: 6-7-2012

Biological Evaluation for Sensitive Fish and Wildlife Species at the Proposed Bulkhead Replacement on Lake Washington, King County, WA: NWS-2012-555

December 10, 2012

Prepared for:

U. S Army Corps of Engineers
Seattle District – Regulatory Branch
Post Office Box 3755
Seattle, WA 98124

Prepared by:



750 Sixth Street South
Kirkland, WA 98033

p 425.822.5242

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watershedco.com



BIOLOGICAL EVALUATION

for Sensitive Fish and Wildlife Species at the Proposed Bulkhead Replacement on Lake Washington, King County, WA: NWS- 2012-555

Prepared for:

U. S Army Corps of Engineers
Seattle District – Regulatory Branch
Post Office Box 3755
Seattle, WA 98124

Prepared on behalf of:

Cameron and Linda Myhrvold
% Al Foltz
Waterfront Construction
205 NE Northlake Way, Suite 230
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December 10, 2012

The Watershed Company Reference Number:
120702

The Watershed Company Contact Person:
Dan Nickel and Sarah Sandstrom

Cite this document as:

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BIOLOGICAL EVALUATION

SECTION 7, ENDANGERED SPECIES ACT

Applicant: Myhrvold Residence

Corps Reference #: NWS-2012-555

1 PROJECT DESCRIPTION

1.1 Location

The proposed project is located on Lake Washington, south of Meydenbauer Bay and north of Chism Beach. The residential property and existing bulkhead are located at 425 Shoreland Drive SE, Bellevue, King County, Washington (SE ¼ of Section 31, Township 25 North, Range 5 East; 47.60445 Latitude, -122.21563 Longitude; Figure 1). Tax parcel number: 5627300197.

1.2 Project Description

The applicant proposes to remove the existing vertical timber bulkhead and its supporting soldier piling and replace it with a battered rock bulkhead, including beach cove with access steps. The intent of the project is to improve access to the shoreline while ensuring adequate shoreline protection, attenuating wave energy, and improving shoreline rearing habitat for juvenile salmonids. The cove area will provide soft shoreline stabilization for approximately 30 feet of shoreline. Shallow water habitat will be increased with the addition spawning gravel, extending 10 feet waterward from the new bulkhead (~feet at the cove). Overall, 70 percent of the existing hard shoreline stabilization will be softened with the battered bulkhead design and spawning gravel. Full project plans can be found in Appendix A. Proposed mitigation consists of 1,386 square feet of native shoreline plantings (Appendix B). The following are key elements of this project:

1. Excavate 379 cubic yards of soil from behind the existing timber bulkhead and remove existing, approximately 267-foot-long, timber bulkhead (~98 cubic yards) and supporting 10"-12" soldier piles. Piles will be removed using a barge-mounted crane and vibratory extractor.
2. Place approximately 300 cubic yards of rock for replacement bulkhead, 160 cubic yards of backfill, and 17 cubic yards of topsoil. A new beach cove will be incorporated into the replacement bulkhead design. The beach cove will

be 30 feet wide by 15 feet deep. The battered rock bulkhead design places the new bulkhead approximately 2 feet back (landward) from the existing bulkhead at the base and 2.5 feet back at the top along approximately 160 feet of shoreline; even with the existing bulkhead at the base and approximately 1.5 back at the top along approximately 75 feet of shoreline; and approximately 9 feet back at the base and 11 feet back at the top along approximately 30 feet along the shoreline (at the cove). Two hundred and sixty (260) cubic yards of spawning gravel will be added waterward of the bulkhead to increase the area of gradually sloping, shallow-water habitat. The battered bulkhead and spawning gravel soften 70 percent of the shoreline.

3. Native shoreline vegetation will be planted in five areas landward of the proposed bulkhead. Planted species are identified in Table 1. The mitigation planting plan is included in Appendix B.
4. The proposed project has applied for a hydraulic project approval (HPA).

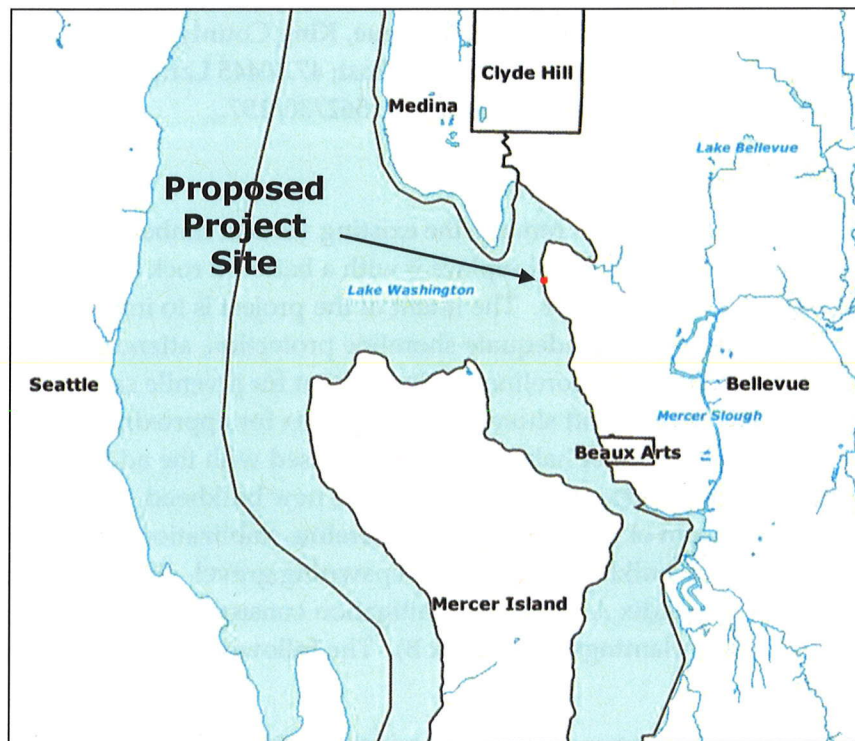


Figure 1. Vicinity map from King County iMAP 2012.



Figure 2. Aerial view of proposed project area from King County iMAP 2009.

Table 1. Species to be planted along the shoreline.

Stratum	Scientific name	Common name	Quantity
Trees	<i>Pinus contorta</i>	Shore line	2
	<i>Thuja plicata</i>	Western red cedar	2
Shrubs	<i>Acer circinatum</i>	Vine maple	3
	<i>Cornus sericea</i>	Red twig dogwood	11
	<i>Holodiscus discolor</i>	Oceanspray	6
	<i>Vaccinium ovatum</i>	Evergreen huckleberry	7
	<i>Viburnum edule</i>	Highbush cranberry	2
	<i>Arctostaphylos uva-ursi</i>	kinnikinnick	460
Groundcover	<i>Eriophyllum lanatum</i>	Oregon sunshine	28
	<i>Gaultheria shallon</i>	Salal	18
	<i>Polystichum munitum</i>	Sword fern	82

1.3 Construction Sequence

The proposed project is expected to take an estimated 8 weeks to complete. Construction activities would occur in the following sequence (provided by Waterfront Construction, Inc. and modified by The Watershed Company):

1. Mobilize construction barge and moor at the site with all required materials and equipment, taking care to ensure that barge does not ground out on lakeshore substrate at any time during the construction project.

2. Install silt containment fence for duration of bulkhead and cove beach developments.
3. Working with barge-based crane, extract 44 existing timber soldier piles positioned waterward of the wood bulkhead. Excavate approximately 379 cubic yards of soil behind existing vertical wooden bulkhead. Remove approximately 98 cubic yards of existing wooden bulkhead. Store extracted piles and wood debris from bulkhead removal on the barge for offsite disposal.
4. Install replacement battered rock bulkhead, coved beach area, and access stairs.
5. Install filter fabric and crushed rock backfill behind the replacement bulkhead structure.
6. Replace soils and level to new top of bulkhead grade.
7. Install beach and spawning gravels, placing spawning gravel along full length of rock bulkhead to a distance of 10 feet waterward, and 25 feet at the cove.

1.4 Standard Conservation Measures

The following conservation measures will ensure that any disturbance to sensitive fish and wildlife species utilizing the action area will be minimized.

1. **Timing Restriction:** Once started, the bulkhead replacement will take approximately 8 weeks to complete. No in-water work will occur from May 1 through 15 July, per the protection policies of the National Marine Fisheries Service (NMFS), U.S. Fish and Wildlife Service (USFWS), and Washington Department of Fish and Wildlife (WDFW) for bull trout (*Salvelinus confluentus*), steelhead (*Oncorhynchus mykiss*), and Chinook salmon (*O. tshawytscha*). The proposed project is not located in an area identified as potential sockeye salmon (*O. nerka*) spawning areas; therefore, additional timing restrictions for sockeye spawning from WDFW are not anticipated.

The combined fish and wildlife timing restrictions are depicted graphically in Table 2. The applicant would comply with any amendments made to the timing restrictions following U.S. Army Corps of Engineers (Corps), NMFS, USFWS, and WDFW review.

Table 2. Applicable work window.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Federal & State fish protection					No in-water work							

2. **Water Quality:** Several conservation measures will be taken in addition to timing restrictions to minimize the exposure of sensitive fish species to turbid waters.
 - (a) a sediment control curtain will be installed and maintained over the duration of the in-water work,
 - (b) excavation will be performed from a barge,
 - (c) the contractor will stockpile sediments on the barge pending off-site disposal,
 - (d) the barge will not be allowed to ground, and
 - (e) all sediment will be properly disposed of on land in such a manner that it cannot enter into the waterway or cause water quality degradation (Section 13, Rivers and Harbors Act).
3. **Shoreline Vegetation:** Existing trees along the shoreline will be retained, and impacts to existing nearshore vegetation will be minimized through the use of a construction barge for most construction activities. Native trees, shrubs, and groundcovers will be planted in five discrete areas adjacent to and upland of the bulkhead (Appendix B).

1.5 Action Area

“Action area” is defined as “all areas to be affected directly or indirectly by the proposed action and not merely the immediate area involved in the action.” Based on the analysis below, the disturbance effects of this project on Chinook and coho salmon (*O. kisutch*), bull trout and steelhead would be realized only at the location of project operations and within a 100-foot in-water radius of the bulkhead. No other areas would be affected directly or indirectly.

2 LISTED SPECIES

The action area is located within the geographic range of three federally listed species of salmonids: 1) Chinook salmon of the Puget Sound Evolutionary Significant Unit (ESU) (Reaffirmed as Threatened, U.S. Federal Register, 28 June

2005), 2) bull trout of the Coastal-Puget Sound Distinct Population Segment (DPS) (Threatened, U.S. Federal Register, 1 November 1999), and 3) steelhead of the Puget Sound DPS (Threatened, U.S. Federal Register, 11 May 2007). Coho salmon of the Puget Sound-Strait of Georgia ESU are also present in the watershed and are currently considered a Species of Concern (U.S. Federal Register, 15 April 2004), indicating that they are under less active consideration for formal listing. An ESU of Pacific salmon is considered to be a DPS and thus a "species" under the Endangered Species Act. All of these species may be present in the action area during a portion of their life cycle (Table 3).

The project area is also located within critical habitat that has been formally designated for Puget Sound Chinook salmon and Coastal-Puget Sound bull trout. Critical habitat for Chinook salmon includes the Lake Washington Subbasin (Watershed Code 17110012-03) of the Puget Sound ESU (U.S. Federal Register, 2 September 2005), and critical habitat for bull trout of the Coastal-Puget Sound DPS includes Lake Washington, which is in Critical Habitat Unit 28 – Puget Sound (U.S. Federal Register, 26 September 2005).

Table 3. Listed species that may use the project area (NMFS/USFWS as of November 28, 2012).

Species	Federal Status	ESU/DPS/Region	Critical Habitat
Chinook salmon <i>Oncorhynchus tshawytscha</i>	Threatened, August 1999 ¹ Reaffirmed, June 2005 ²	Puget Sound DPS	Yes
Bull trout <i>Salvelinus confluentus</i>	Threatened, November 1999 ³	Coastal-Puget Sound DPS	Yes
Steelhead <i>Oncorhynchus mykiss</i>	Threatened, May 2007 ⁴	Puget Sound DPS	No*
Coho salmon <i>Oncorhynchus kisutch</i>	Species of Concern, April 2004 ⁵	Puget Sound-Strait of Georgia ESU	NA

¹U.S. Federal Register, 2 August 1999.

⁴U.S. Federal Register, 11 May 2007.

²U.S. Federal Register, 28 June 2005.

⁵U.S. Federal Register, 15 April 2004.

³U.S. Federal Register, 1 November 1999.

* Critical habitat for the Puget Sound steelhead DPS is under review and has not been determined as of November 28, 2012.

3 DESCRIPTION OF PROJECT AREA

The baseline conditions that Chinook and coho salmon, steelhead, and bull trout presently face in the Lake Washington watershed are described in the *Endangered Species Act Guidance for New and Replacement Piers and Bulkheads in Lake Washington, Lake Sammamish, and the Ship Canal, Including Lake Union* (Corps et al. 2001); *Salmon and Steelhead Habitat Limiting Factors Report for WRIA 8* (Kerwin 2001); and the *Lake Washington/Cedar/Sammamish Watershed (WRIA 8) Chinook*

Salmon Conservation Plan (WRIA 8 2005). This discussion describes the relevant site-specific baseline conditions within the action area, in particular focusing on those items that are different in condition from Lake Washington as a whole. The conditions for the Lake Washington basin and the action area are summarized in Table 4.

Sarah Sandstrom, Fisheries Biologist, and Mark Garff, Senior Landscape Architect, of The Watershed Company, conducted a site visit on 28 November 2012. The following description of existing conditions is based upon observations from the site visit and from materials supplied by the applicant and contractor.

The property is located in a residential community south of Meydenbauer Bay and North of Chism Beach Park. The existing vertical timber bulkhead prevents erosion of the shoreline from wave energy resulting from west winds and the wakes of passing boats. The timber bulkhead is situated between rock bulkheads on residential properties to the north and south. The property's shoreline also includes a residential pier. The pier will not be altered by the proposed project, except to replace the bulkhead under the most landward portion of the pier.

The existing bulkhead is approximately 267 feet long and 4' 8" high (measured from the beach substrate). The piles, which support the structural integrity of the bulkhead, exhibit noticeable deterioration (Figure 3). Structural details regarding the existing bulkhead construction can be found in Appendix A. The existing bulkhead is partially submerged at Ordinary High Water (21.80'). At the time of the site visit, the lake level was at 20.10' (Corps 2012, electronic data), and the water level was approximately 8 inches below the toe of the bulkhead at roughly the center of the property (Figure 4).

Vegetation along the northern 65 feet of the shoreline includes a mixture of native and ornamental shrubs and grasses (Figure 5). Vegetation along the remainder of the shoreline to the south is predominantly mowed lawn extending approximately 40 feet landward of the bulkhead (Figure 6). A few mature trees overhang the shoreline, including a paper birch (*Betula papyrifera*), a Lebanon cedar (*Cedrus libani*), and a western red cedar (*Thuja plicata*). A large blue atlas cedar (*Cedrus atlantica*), located near the northern parcel boundary on the neighboring property also overhangs the shoreline. Invasive species were not noted at the site.

The littoral substrate is dominated by sand and gravel from the shoreline to approximately 30 feet waterward of the bulkhead (Figure 7). Beyond 30 feet, the substrate is predominantly composed of sand. Unidentified rooted aquatic vegetation is present beginning 30 feet waterward of the existing bulkhead. No fish or wildlife were observed at the project site.

Table 4. Checklist for Documenting Environmental Baseline and Effects of Proposed Action(s) on Relevant Indicators – Draft modified by NOAA Fisheries for lakes.

PATHWAYS INDICATORS	ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTION(S)		
	Properly Functioning	At Risk ¹	Not Prop. Functioning	Restore ¹	Maintain ²	Degrade ³
Water Quality						
Temperature/ Dissolved Oxygen		X			X	
pH		X			X	
Chem. Contamination		X			X	
Nutrients/Total P		X			X	
Habitat Access						
Physical Barriers		X			X	
Habitat Elements						
Exotic Species (in water)			X		X	
Shoreline Upwelling/ Downwelling		X			X	
Structural Complexity (LWD/emergent/ submergent vegetation)		X			X	
Substrate Composition			X		X	
Shoreline Conditions						
Shoreline Vegetation and Riparian Structure		X		(at project site)	X	
Shoreline Gradient		X		(at project site)	X	

¹ For the purposes of this checklist, "restore" means to change the function of an "at risk" indicator to "properly functioning," or to change the function of a "not properly functioning" indicator to "at risk" or "properly functioning" (i.e., it does not apply to "properly functioning" indicators).

² For the purposes of this checklist, "maintain" means that the function of an indicator does not change (i.e., it applies to all indicators regardless of functional level).

³ For the purposes of this checklist, "degrade" means to change the function of an indicator for the worse (i.e., it applies to all indicators regardless of functional level). In some cases, a "not properly functioning" indicator may be further worsened, and this should be noted.



Figure 3. Deteriorating piles in existing bulkhead structure.

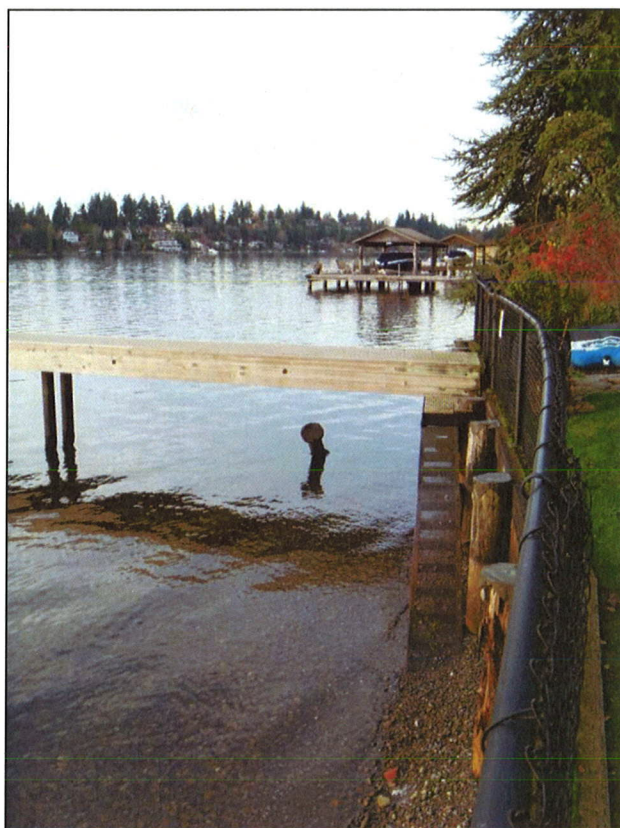


Figure 4. Toe of bulkhead, water level on November 30, 2012.



Figure 5. View of bulkhead and existing upland vegetation on north side of existing pier.



Figure 6. View of bulkhead, lawn, and upland vegetation on south side of pier.



Figure 7. Gravel substrate adjacent to bulkhead.

4 SPECIES INFORMATION AND SITE USE

Site-specific information about each species is presented below. General and lake-specific life history information related to temperature, diet, and migration is contained in the Federal Register listings (Table 2) and the *Endangered Species Act Guidance for New and Replacement Piers and Bulkheads in Lake Washington, Lake Sammamish, and the Ship Canal, Including Lake Union* (Corps et al. 2001).

All anadromous fish spawning in streams, rivers, and lakes in the Lake Washington basin must travel through the Ballard Locks, Lake Union and the Lake Washington ship canal on their way to and from Puget Sound and the Pacific Ocean. Some of these salmonids may migrate along the Bellevue shoreline.

4.1 Chinook Salmon

In the Lake Washington watershed, Chinook salmon are broken into two stocks: 1) the Cedar River, and 2) the Sammamish River (City of Seattle 2008). The majority of summer/fall-run Chinook salmon migrate through the Lake Washington ship canal to reach spawning habitat in either the Cedar or Sammamish River systems, while a smaller proportion of Chinook salmon spawn in other Lake Washington tributaries. The Lake Washington basin has seen an average escapement of 819 returning Chinook salmon from 1994 to 2007 (City of Seattle 2008).

Occasional beach spawning within Lake Washington has also been observed (Hendry and Quinn 1997). Adults migrate into freshwater in late July through early September and spawn in the tributaries to Lake Washington between August and November (City of Seattle 2008). Typically, Chinook salmon travel through the ship canal in two or fewer days at depths of approximately 20 feet (City of Seattle 2008).

Graphs of trapping data indicate that juvenile Chinook salmon migrating from the tributaries into Lake Washington exhibit two basic strategies: 1) direct migration to the lake as fry without extended stream rearing; and 2) migration to the lake as parr or smolts (average length 100 mm), following extended stream rearing. Chinook fry begin entering Lake Washington around the first of the year, peaking in February, while parr and smolts enter the lake from April through July, peaking in late May (Tabor et al. 2006). Juveniles entering the lake as fry rear until they emigrate as smolts beginning in April. The majority of the juvenile Chinook salmon in the Lake Washington basin emigrate from the system via the Lake Washington ship canal by mid-summer, peaking in June, and most of the remaining juveniles have left by September. However, some juveniles exhibit extended rearing in the Lake Washington basin (emigrating as 2-year olds), while a small fraction have been observed to residualize in the lake.

The project site is located approximately 11 km north of the mouth of the Cedar River and 17 km south of the mouth of the Sammamish River. The nearest Chinook salmon spawning stream is Kelsey Creek, located approximately 4 km southeast of the project site.

Past studies of juvenile Chinook salmon in Lake Washington indicate that the density of Chinook salmon fry using south Lake Washington shorelines in the spring decreases logarithmically with increasing distance from the mouth of the Cedar River (Figure 8, Tabor et al. 2006). At nearby Chism Beach, only two juvenile Chinook salmon were observed in night-snorkels conducted from March- June in 2002 (Tabor et al. 2006). Given the location of the project area, few Chinook salmon fry would be expected to rear along the shorelines of the project area in the spring months. In June, Tabor et al. (2004) observed low

densities of Chinook salmon (~ 0.005 fish/m²) at surveyed sites closest to the project area (north end of Mercer Island), and the relationship between the density of Chinook salmon smolts and distance from the Cedar River mouth was no longer apparent (Tabor et al. 2006). Based on these findings, Chinook salmon fry are not expected to use the project area in the spring, and Chinook salmon smolts likely use the project area in low densities.

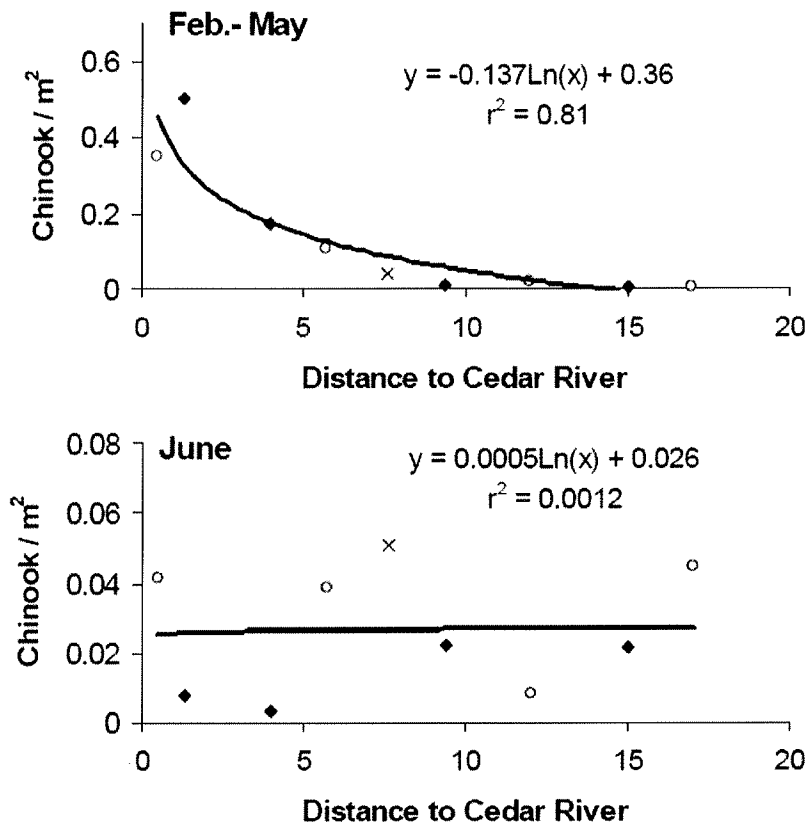


Figure 8. From Tabor et al. 2006. Relationship (logarithmic function) between the mean juvenile Chinook salmon density and the shoreline distance (km) to the mouth of the Cedar River in south Lake Washington, 2003. The February-May density represents the mean of nine surveys dates from February 4 to May 27. The June density represents the means of June 9 and June 23. Sites include four west shoreline sites (open circles), four east shoreline sites (solid diamonds) and one site on Mercer Island (cross mark). The distance to the Cedar River for the Mercer Island site includes the distance from Coleman Point to South point.

Early in the period of lake residency, Chinook salmon fry are typically found along the shorelines in waters less than 1.6 feet (Tabor et al. 2006). Results from hydroacoustic sampling in 2002 suggest that juvenile Chinook are found at greater depths (6 to 23 feet deep) and distance from shore in May and June

(Tabor et al. 2006). Water depths within the project site range from approximately 1 to 3 feet.

In conclusion, juvenile Chinook salmon may migrate past the action area from January through September. However, based on the location of the action area, it is unlikely that significant numbers of Chinook salmon fry rear in the area. Chinook salmon parr and smolts may use the area in low densities, generally away from the shoreline. Adult Chinook salmon may pass through the action area from June through September, but would not be expected in the nearshore area where bulkhead replacement work would occur.

4.2 Bull Trout

Native char are not commonly observed within Lake Washington. Bull trout are observed at the Ballard Locks every year with numbers observed or caught varying from three to nine fish per year (F. Goetz, pers. comm., 14 May 2004). Bull trout entering and exiting the ship canal would likely occur between February and June, with those fish coming from North Puget Sound tributaries. They are observed/caught at the Locks between May and July (note: little or no monitoring occurs at the Locks from February through April, so data are not available for that time period). In 2003, two bull trout were observed entering the ship canal in June (F. Goetz, pers. comm., 14 May 2004). In Lake Washington, bull trout have been captured during winter and spring, typically in the south Lake Washington/Cedar River area.

Little is known about bull trout distribution or habitat use within Lake Washington, and any current projections are generally based on extrapolation of similar information from other bull trout populations. Bull trout would not be expected within the littoral zone when nearshore temperatures exceed 15°C (generally, from May through mid-October). Juvenile bull trout remain in headwater streams until the onset of piscivory, at a body length of approximately 300 mm, at which point they migrate as subadults in search of improved foraging opportunities. Subadult bull trout often migrate with adults to headwater streams during the summer and fall, and return to larger rivers to overwinter. Bull trout may be attracted to spawning aggregations of prey fish. Many native char in populations from north Puget Sound exhibit anadromy, migrating to marine waters in late winter (F. Goetz, pers. comm., 14 May 2004).

In conclusion, the expected presence of juvenile bull trout in Lake Washington near the project area is very limited to unlikely. Adult and subadult bull trout would avoid the littoral zone during the summer due to excessive temperatures and are not expected to use the nearshore areas where bulkhead replacement activities for the proposed project would occur.

4.3 Steelhead

Lake Washington winter steelhead are currently present in the watershed and are identified as a discrete stock within the Puget Sound steelhead DPS. Lake Washington winter steelhead are characterized as a native stock with wild production, and their stock status was adjusted downward from “depressed” to “critical” in 2002 due to chronically low escapements and severe short-term declines in escapement in 2000 and 2001. The Lake Washington basin has seen an average escapement of 199 returning steelhead from 1980 to 2007, with the lowest (of only 8 fish returning) in 2006 to 2007 (City of Seattle 2008). Historic steelhead escapement for the Lake Washington basin was estimated at 1,816 in 1986 and has steadily declined since that time.

Steelhead likely spawned historically in many Lake Washington and Lake Sammamish tributaries. Adult steelhead may pass through the ship canal from February through June (City of Seattle 2008). The steelhead spawning period in the Lake Washington basin currently extends from March to September (City of Seattle 2008), with most adult fish in the run typically returning to the Cedar River. Both anadromous (steelhead) and resident (rainbow trout) life forms of *O. mykiss* (based on life history characteristics) are likely present in the Lake Washington basin.

Juveniles generally emigrate as smolts between April and June, after two years of stream residence. However, the duration of freshwater rearing can range from one to seven years before juveniles grow large enough (>170 mm) to undergo smoltification. Steelhead exhibit a highly variable anadromous life history. Summer steelhead, also known as stream-maturing, typically enter freshwater from May to October in a sexually immature condition and remain in rivers all winter, spawning the following spring. Summer steelhead are slightly smaller and generally return to cooler streams further inland than winter steelhead characteristic of coastal streams, which enter freshwater from November to April with well-developed gonads and spawn shortly thereafter (Busby et al. 1996). Steelhead in the Lake Washington basin are most likely winter run fish, and summer steelhead are not thought to inhabit the watershed.

Summer surface temperatures in the Lake Washington system often exceed the thermal preferences of most salmonids, including steelhead.

In conclusion, juvenile steelhead may be emigrating through Lake Washington throughout the year, but would likely not rear in Lake Washington nor be expected in the nearshore area during the time frame for in-water work. Adult steelhead would not be present in the action area until after the construction period had ended. The nearest stream with documented steelhead use is Coal Creek, located approximately 4 km southeast of the project site.

4.4 Coho Salmon

Adult coho salmon migrate through Lake Union and the ship canal to reach tributaries suitable for spawning from late-September through November. Adults spawn from October through February, peaking between November and December in most tributaries. The Lake Washington basin has seen an average escapement of 871 returning coho from 1998-2006 (City of Seattle 2008).

Most juvenile coho enter Lake Washington from tributaries as smolts (average length >100 mm) in mid-May to late June or as young-of-year fish (City of Seattle 2008). Beak Consultants Incorporated (1998) reported that the peak coho smolt migration from the Sammamish River into Lake Washington occurs April through mid-May, coinciding with releases from the Issaquah hatchery. In general, peak coho outmigration takes place in May (Weitkamp et al. 1995). Thus, the majority of juvenile coho are not rearing in Lake Washington for extended periods; rather, they are emigrating via the ship canal, only spending a matter of days in the system before transitioning to saltwater (City of Seattle 2008). However, a small number of coho juveniles have been found to migrate out of the Lake Washington system one or two years later than the bulk of the population (DeVries et. al. 2005). This variation in juvenile salmonid emigration timing may be attributable to increasing water temperatures, primarily caused by increasing air temperatures throughout the northwest (Wetherbee and Houck 2000). Smolts may respond to water temperatures through: 1) avoidance (~15°C), 2) smoltification ability (15-16°C), and 3) changes in growth (19-20°C) (City of Seattle 2008). Juvenile coho may avoid the high temperatures in the littoral zone during the summer, and are likely to migrate from the littoral zone or from the lake before water temperatures exceed 17°C, which often occurs in shallow areas by mid- to late-June.

In conclusion, juvenile coho may be emigrating through Lake Washington from mid-March through June. Given the life-history strategy of juvenile coho salmon, juvenile rearing in the action area is not expected. Adult coho may be in the action area from August to December, but would not be expected in the nearshore area where bulkhead replacement activities would occur.

5 SPECIES IMPACTS

The effects of the proposed project on the overall conditions of the Lake Washington basin and the action area are indicated in the NOAA Fisheries "Checklist for Documenting Environmental Baseline and Effects of Proposed Action(s) on Relevant Indicators" as revised by NOAA Fisheries for lakes (see Table 3). The proposed project could potentially affect Chinook and coho salmon, bull trout and steelhead in generally similar manners. Effects may often

occur through impacts to their forage species. Thus, unless otherwise noted, there will be no distinction between listed salmonids in the following discussion.

5.1 Direct Effects on Salmonids

1. **Water Quality (substrate disturbance and discharge of waste products):** Excavation and fill for the replacement of the existing bulkhead by the off-shore construction barge could produce temporary, localized sediment plumes that would dissipate following cessation of activity. To minimize construction impacts associated with increased turbidity and the potential for release of toxic chemicals during construction, the following timing restrictions and conditions are proposed:
 - No in-water construction activity will occur at a minimum between 1 May and 15 July for protection of fish.
 - A sediment control curtain will be installed and maintained during the duration of in-water work.
 - Excavation and construction activities will be performed from a barge. The contractor will stockpile sediments on the barge pending off-site disposal.
 - The barge will not be allowed to ground.
 - All sediments will be properly disposed of on land in such a manner that they cannot enter into the waterway or cause water quality degradation (Section 13, Rivers and Harbors Act).

Bulkhead replacement is anticipated to take no longer than 8 weeks. Some studies investigating the effects of turbidity on juvenile salmonids in a lacustrine environment suggest that turbidity can have beneficial effects on the feeding and survival of salmonids (Gregory 1994, Mazur and Beauchamp 2003, Mazur and Beauchamp 2006), as well as other species of juvenile fishes (Kitano et al. 2008). Juvenile Chinook salmon of the body size that could be present at the site during construction were found to have their peak foraging rates when turbidities were between 70-150 NTUs (Gregory 1994), conditions generally considered to be moderate to highly turbid water. Similarly, piscivorous cutthroat trout, the primary predator on juvenile salmon in Lake Washington, have reduced foraging rates under turbid conditions greater than 7 NTUs (Mazur and Beauchamp 2003).

Despite potential ecological advantages, turbidity is generally considered an undesirable condition for salmonids, as exposure to potentially contaminated or abrasive sediments suspended in the water column is thought to result in lethal and sub-lethal effects (Newcombe and MacDonald 1991). However, localized episodic turbidity events from an individual construction activity

would not represent a permanent sediment source and would not produce conditions of chronic exposure necessary to produce a direct detrimental effect on juvenile fishes (Newcombe and MacDonald 1991).

Considering that the turbidity produced by construction activity would be localized and temporary, the most probable impact on juvenile salmonids would be a behavior modification (avoidance response), rather than injury or reduction in growth potential. An avoidance response could expose juvenile salmonids to increased predation or force them away from preferred rearing areas.

The most effective strategy for minimizing or eliminating potential construction-related impacts would be to restrict construction to periods when the presence of Chinook and coho salmon, steelhead, and bull trout is improbable. The combined fish-protection prohibitions on in-water construction by NOAA Fisheries, USFWS, and WDFW result in an allowable in-water construction window of 16 July through April 30. This window is adequate to minimize the probability that Chinook and coho salmon, steelhead, or bull trout would be in the action area during construction. Thus, temporary water quality impacts associated with the proposed project are insignificant and discountable. The addition of rigid-stemmed vegetation to the shoreline as part of the mitigation plan will benefit water quality long-term.

2. **Noise:** The removal of the existing bulkhead and piles will produce temporary noise and vibration resulting from use of the barge, vibratory extractor, and other excavation equipment. Underwater noise from vibratory extraction of the piles will be greater than that of other excavation and construction equipment. Maximum underwater noise generated from the vibratory pile extraction would be attenuated to a level below the disturbance threshold for small fish (150 db) at a distance of approximately 56 feet from the project area. Noise levels are not anticipated to cause direct injury to salmonids, although fish present within 56 feet of the project activities could experience direct injury or display an avoidance response, which would expose them to increased predation or force them away from preferred rearing areas. In order to minimize the impacts on Chinook and coho salmon, bull trout, and steelhead, the above timing restriction (no in-water construction at a minimum from May 1 through 15 July) would be followed. This restriction is adequate to minimize the probability that those species would be in the action area during construction. By constructing during the approved work windows, noise impacts are rendered insignificant.
3. **Habitat:** The proposed project will improve shallow water habitat and substantially increase the area of native shrub and tree cover in the shoreline

buffer. The proposed design will replace an existing vertical timber bulkhead that extends below the ordinary high water mark (OHWM) with a battered design (4:1 slope), set back rock bulkhead, and coved beach area. The addition of spawning gravel waterward of the proposed rock bulkhead will result in a more gradually sloping shoreline that attenuates wave energy and provides preferred rearing habitat for Chinook salmon fry. This represents a softening of 70 percent of the existing hard shoreline stabilization. Past studies in Lake Washington have found that during the period from mid-February to mid-April, juvenile Chinook rear along shorelines less than 1.6-foot depth, with less than 20 percent slopes (Tabor et al. 2006); by setting back the bulkhead, creating a beach cove, and adding spawning gravel, the proposed design will improve the natural, gradual shoreline gradient and increase the area of shallow water habitat, creating a benefit for fish rearing in shallow waters. Juvenile Chinook salmon also prefer shallow water habitats with overhanging vegetation (approximately 4.5:1 ratio of fish using overhanging vegetation: fish occurring away from overhanging vegetation) (Tabor et al. 2004, 2006); overhanging vegetation (both the length along the shoreline and overall cover) will be increased by the proposed shoreline mitigation plan.

Excavation activity will disturb the benthic substrate within the immediate project area during the implementation of the project. This disturbance will be limited to the area immediately surrounding the bulkhead, and a silt fence will be positioned 10 feet waterward of the existing bulkhead to ensure that any turbid waters are limited to the immediate vicinity. Boat activity in or adjacent to vegetated shallows has been documented to damage and/or destroy vegetated shallows (Fonseca et al. 1998). As stated above, the barge would not be permitted to ground; however, use of the barge within the area does have the potential to damage existing submerged aquatic vegetation located 30 feet waterward of the bulkhead. Such impacts would be temporary and minor in scale. Thus, impacts to habitat are insignificant and/or discountable. The proposed shoreline plantings will provide overhanging cover and improve habitat overall.

4. **Direct Mortality:** The potential to kill Chinook salmon, bull trout, steelhead, or coho salmon exists as long as they are present in the action area during excavation and construction activities. In order to minimize the project impacts on these salmonids, the previously stated timing restriction (no in-water construction at a minimum from 1 May through 15 July) would be followed. This restriction is adequate to minimize the probability that juvenile salmonids would be in the action area during construction activities.

5.2 Indirect Effects on Salmonids

The effects resulting from the activity that are later in time could include changes in water quality experienced by juvenile salmonids.

1. **Water Quality:** The proposed project will significantly increase the density and aerial coverage of native vegetation along the shoreline. Rigid-stemmed native plantings filter nutrients and contaminants from upland runoff, contributing to improved water quality conditions in the lake over time.
2. **Habitat:** Native riparian vegetation will be installed along the majority of the shoreline. As the vegetation matures, detritus and terrestrial insect input from the overhanging vegetation will eventually increase allochthonous food supply for juvenile salmon. Thus, the implementation of this shoreline restoration will likely improve foraging conditions for juvenile salmonids in the action area.

5.3 Other Effects

For all other pathways and indicators not specifically mentioned above, the activity will not alter the present environmental baseline.

5.4 Collective Effects

The proposed timing restrictions and conditions would minimize the potential for project-related impacts. Thus, the proposed project:

- may affect, but is not likely to adversely affect, Puget Sound Chinook salmon;
- may affect, but is not likely to adversely affect, Coastal-Puget Sound bull trout; and
- may affect, but is not likely to adversely affect, Puget Sound steelhead;
- would not jeopardize Puget Sound-Strait of Georgia coho salmon.

6 CRITICAL HABITAT

6.1 Chinook Salmon

Critical habitat was designated for the Puget Sound Chinook salmon DPS on 2 September 2005 (U.S. Federal Register), specifically including the Lake Washington sub-basin (Watershed Code 1711001203). Critical habitat includes areas with physical or biological features essential to the conservation of the

species and which may require special management considerations or protection. Primary constituent elements of Chinook salmon critical habitat are listed as:

1. Freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation and larval development.
2. Freshwater rearing sites with water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility; water quality and forage supporting juvenile development; and natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks.
3. Freshwater migration corridors free of obstruction with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival.
4. Estuarine areas free of obstruction with water quality, water quantity, and salinity conditions supporting juvenile and adult physiological transitions between fresh- and saltwater; natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels; and juvenile and adult forage, including aquatic invertebrates and fishes, supporting growth and maturation.
5. Nearshore marine areas free of obstruction with water quality and quantity conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation; and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels.
6. Offshore marine areas with water quality conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation.

Project activities that introduce or remove physical elements to and/or from Lake Washington, or that contribute to short-term changes in water quality, may alter certain primary constituent elements (Table 5). For the proposed project, this is limited to the excavation and grading activities.

Table 5. Assessment of primary constituent elements for Chinook salmon.

Primary Constituent Elements	Direct, Indirect, Interrelated and Interdependent Effects
1. Freshwater spawning	Typically not applicable in a lake environment. Chinook rarely spawn in Lake Washington. The same threats exist under the present site conditions and no change in usage of the site would occur with the proposed project. Temporary water quality impacts are possible with the suspension of potentially contaminated

Primary Constituent Elements	Direct, Indirect, Interrelated and Interdependent Effects
	sediments.
2. Freshwater rearing	The proposed project may impair shoreline foraging and refuge habitat for juvenile Chinook salmon during excavation and construction activities. Impacts will be minimized appropriately by following the conservation measures and timing restrictions mentioned previously. The project outcome will improve freshwater rearing by restoring shallow water habitat preferred by juvenile Chinook salmon. By sloping back the proposed bulkhead, wave energy will be better attenuated, again improving preferred shallow water rearing habitat.
3. Freshwater migration	Juvenile and adult Chinook salmon migrate past the project site. The proposed project may result in avoidance behavior during excavation, but impacts will be minimized by following the conservation measures and timing restrictions mentioned previously.
4. Estuarine areas	The project would have no effect on estuarine areas.
5. Nearshore marine areas	The project would have no effect on nearshore marine areas.
6. Offshore marine areas	The project would have no effect on offshore marine areas.

As stated in Table 5, it is unlikely that the project site would be frequented by migrating Chinook salmon. Proposed impact minimization measures would help ameliorate any impacts to nearshore foraging and migratory conditions for juvenile Chinook salmon. Given the direct, indirect, interrelated, and interdependent effects from the proposed action, the proposed project:

- may affect, but is not likely to adversely modify the critical habitat of the Puget Sound Chinook salmon DPS.

6.2 Bull Trout

The action area includes critical habitat for bull trout, which has been defined for lakes as “the perimeter of the water body as mapped on standard 1:24,000 scale maps” (U.S. Federal Register, 26 September 2005). The action area is in the *Puget Sound Unit* (Unit 28), *Lake Washington CHSU* (critical habitat subunit). Bull trout critical habitat includes these primary constituent elements (excerpted from the final rule, U.S. Federal Register, 26 September 2005):

1. Water temperatures ranging from 36 to 59 [deg]F (2 to 15 [deg]C), with adequate thermal refugia available for temperatures at the upper end of this range. Specific temperatures within this range will vary depending on bull trout life history stage and form, geography, elevation, diurnal and seasonal variation, shade, such as that provided by riparian habitat, and local groundwater influence;

2. Complex stream channels with features such as woody debris, side channels, pools, and undercut banks to provide a variety of depths, velocities, and instream structures;
3. Substrates of sufficient amount, size, and composition to ensure success of egg and embryo overwinter survival, fry emergence, and young-of-the-year and juvenile survival. A minimal amount of fine substrate less than 0.25 in (0.63 cm) in diameter and minimal substrate embeddedness are characteristic of these conditions;
4. A natural hydrograph, including peak, high, low, and base flows within historic ranges or, if regulated, a hydrograph that demonstrates the ability to support bull trout populations by minimizing daily and day-to-day fluctuations and minimizing departures from the natural cycle of flow levels corresponding with seasonal variation;
5. Springs, seeps, groundwater sources, and subsurface water connectivity to contribute to water quality and quantity;
6. Migratory corridors with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and foraging habitats, including intermittent or seasonal barriers induced by high water temperatures or low flows;
7. An abundant food base including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish;
8. Few or no nonnative predatory, interbreeding, or competitive species present; and
9. Permanent water of sufficient quantity and quality such that normal reproduction, growth and survival are not inhibited.

According to the Federal Register, Lake Washington “provides FMO [foraging, migratory and overwintering] habitat for amphidromous bull trout outside of currently delineated core areas in the Puget Sound Recovery Unit.” Project activities that introduce or remove physical elements from the lake, or that contribute to short-term changes in water quality may alter certain primary constituent elements (Table 6).

Table 6. Assessment of primary constituent elements for bull trout.

Primary Constituent Elements (PCEs)	Direct, Indirect, Interrelated and Interdependent Effects
1. Water temperature	The project would have no little effect on water temperature.
2. Complex stream channel	N/A in a lake environment.
3. Substrate	N/A in a lake environment.

Primary Constituent Elements (PCEs)	Direct, Indirect, Interrelated and Interdependent Effects
4. Natural hydrograph	The project would have no effect on the natural hydrograph.
5. Spring, seeps, groundwater sources and subsurface water connectivity	The project would have no effect on groundwater sources or connectivity.
6. Migratory corridors with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering and foraging habitats	The proposed project would not create any barrier to migration, particularly as lake bull trout are larger fish that are not generally subject to predation-pressure and are not oriented near the shoreline.
7. Abundant food base	The project would have little to no effect on food supplies.
8. Few or no nonnative predatory, interbreeding, or competitive species	The proposed project is not expected to increase populations of any predatory, interbreeding or competitive species.
9. Permanent water of sufficient quantity and quality such that normal reproduction, growth and survival are not inhibited.	The same threats exist under the present site conditions and no change in usage of the site would occur as a result of the proposed project. Potential temporary water-quality impacts are possible as a result of sediment disturbance. Impacts will be minimized appropriately by following the conservation measures and timing restrictions mentioned previously.

Given the direct, indirect, interrelated, and interdependent effects from the proposed action, the proposed project:

- **may affect, but is not likely to adversely modify the critical habitat for the Coastal-Puget Sound bull trout DPS.**

6.3 Steelhead

Critical habitat is currently being developed for Puget Sound steelhead.

6.4 Coho Salmon

Critical habitat has not been designated for coho salmon.

7 ESSENTIAL FISH HABITAT

Discussions regarding essential fish habitat (EFH) related to Pacific salmon present in the Lake Washington basin are indirectly included in this Biological Evaluation (BE). The information below identifies where these discussions are located within the BE and concludes with a determination of effect. In accordance with the comments from the Corps and prior concurrence letters from NOAA Fisheries, this discussion should be considered sufficient to make this determination.

Description of the Project / Proposed Activity: The project description and location are described within the first section of the BE. This description gives a thorough explanation of the bulkhead replacement activities. Pacific salmon species of interest related to EFH in the project area are Chinook and coho salmon (U.S. Federal Register 15 October 2008).

Potential Adverse Effects of the Proposed Project: The following is a description of Pacific salmon EFH per the federal Fisheries Management Plan (FMP). EFH for the Pacific coast salmon fishery means those waters and substrate necessary for salmon production needed to support a long-term sustainable salmon fishery and salmon contributions to a healthy ecosystem. To achieve that level of production, EFH includes all those streams, lakes, ponds, wetlands, and other currently viable water bodies and most of the habitat historically accessible to salmon in Washington, Oregon, Idaho, and California. Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMF), and longstanding, naturally-impassable barriers (e.g., natural waterfalls in existence for several hundred years).

Potential direct impacts to Pacific salmon EFH, as described in Section 5 of this BE, include the potential production of temporary, localized sediment plumes that would dissipate following cessation of excavation and bulkhead replacement activities; the potential release of assorted heavy metals stored in the sediments; potential noise and vibration generation during pile extraction, excavation and grading or from the barge; improving rearing habitat for juvenile salmon by increasing the area of shallow water shoreline habitat, and the potential to kill Chinook or coho salmon, bull trout, or steelhead as long as they are present in the action area during construction activities. Potential indirect impacts may include improving water quality, and increasing the supply of allochthonous material to the nearshore through the shoreline revegetation plan.

EFH Conservation Measures: The following impact minimization measures are being incorporated into the proposed project in order to reduce the collective impact.

1. A sediment control curtain will be installed and maintained over the duration of the in-water work;
2. Bulkhead backfill excavation will be performed by a track hoe positioned on land from the construction barge;
3. The contractor will stockpile sediments on the barge pending off-site disposal;
4. The barge will not be allowed to ground;

5. All sediment will be properly disposed of on land in such a manner that it cannot enter into the waterway or cause water quality degradation (Section 13, Rivers and Harbors Act).

Conclusion: All of the proposed project's potential impacts on Pacific salmon EFH are considered collectively. While there are both beneficial and detrimental effects that could result from the proposed project, the detrimental effects have been minimized. Thus, the collective impact of the proposed project:

- may affect, but is not likely to adversely affect, Pacific salmon EFH.

8 CUMULATIVE IMPACT

Cumulative impacts were assessed through the review of aerial photos and a site visit. At present, the project area is bounded on both sides by residential rock bulkheads with associated pier structures. Any plans for activities subject to local, but not federal, regulation would comply with all applicable ordinances governing construction and soil disturbance near water. These regulations are becoming increasingly restrictive to the benefit of sensitive fish and wildlife in response to the listings of Chinook salmon, bull trout, and steelhead, and the potential listing of coho salmon in the future. There are no significant wildlife habitats or special habitat elements present on the property that would be disturbed by any foreseeable activity.

Waterward of the OHWM in the action area, future activities include recreational boating/activities and ongoing moorage of boats along nearby docks. Projections of activities not under federal regulation on properties adjacent to the action area are speculative at best. Changes in presently ongoing activities are not expected. Cumulative impacts (as defined in the ESA) on sensitive fish and wildlife species and their habitats that could potentially result from this proposal are not considered significant.

9 DETERMINATION OF EFFECT

Determination of effect for all species and their respective assessment areas are listed in Table 7. The proposed bulkhead replacement and shoreline enhancement project may affect, but is not likely to adversely affect, Puget Sound Chinook salmon, Coastal-Puget Sound bull trout and Puget Sound steelhead, and is not likely to jeopardize Puget Sound-Strait of Georgia coho salmon.

Given the direct, indirect, interrelated, and interdependent effects from the proposed action, the proposed project would not adversely modify the critical habitat of the Puget Sound Chinook salmon or the Coastal-Puget Sound bull trout.

The collective impact of the proposed project may affect, but is not likely to adversely affect, Pacific salmon EFH.

Table 7. Determination of Effect.

Species	Overall Project Effect	Effect on Critical Habitat	Effect on EFH
Puget Sound DPS Chinook salmon	May affect, not likely to adversely affect	Would not adversely modify	May affect, not likely to adversely affect
Coastal-Puget Sound DPS Bull trout	May affect, not likely to adversely affect	Would not adversely modify	N/A
Puget Sound DPS Steelhead	May affect, not likely to adversely affect	N/A	N/A
Puget Sound-Strait of Georgia ESU Coho salmon	Not likely to jeopardize	N/A	May affect, not likely to adversely affect

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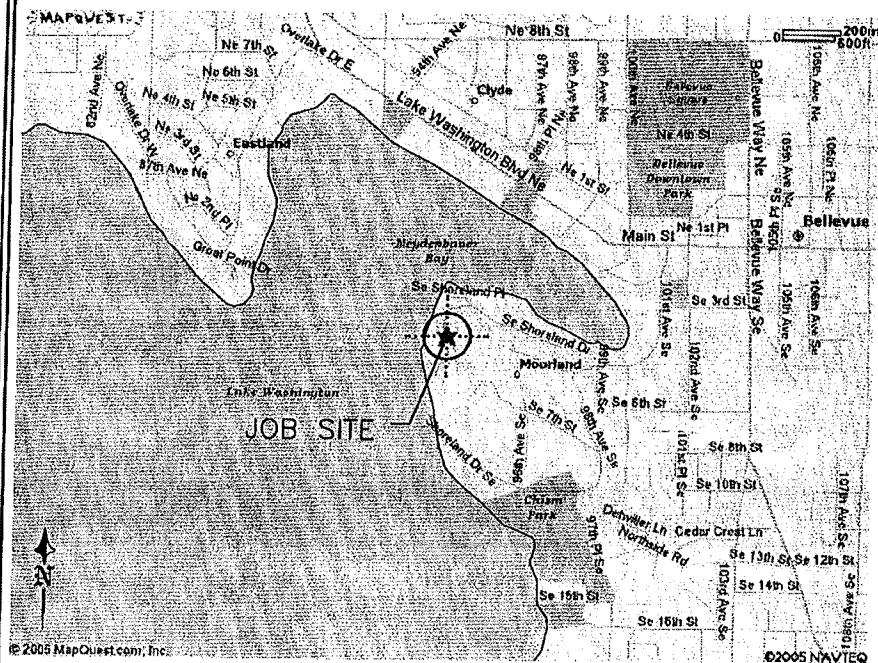
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APPENDIX A

Project Plans

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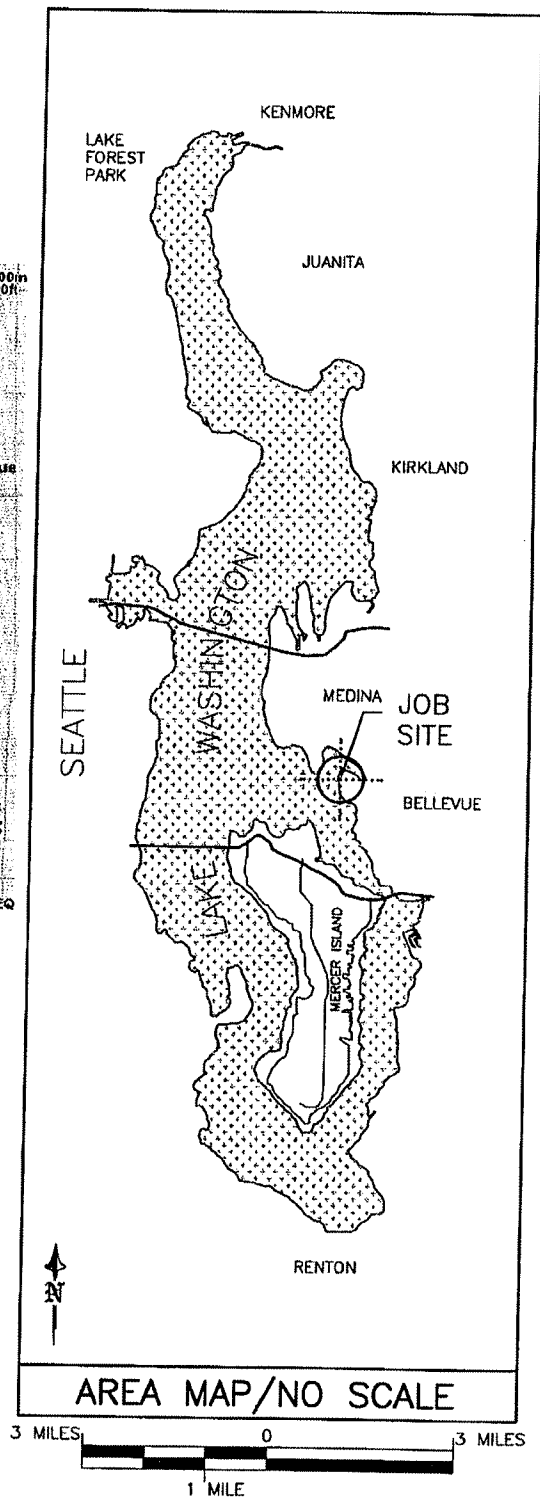
VICINITY MAP/NO SCALE

LEGAL DESCRIPTION

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MOORLAND ADD POR OF BLKS 6-7-8 & NLY 40 FT OF BLKS 5 & 10 &
 OF VAC STS ADJ BEG AT NXN OF C/L OF 94TH AVE SE & N LN OF PLAT
 TH S 89 DEG 53 MIN 49 SEC W 296 FT TH S 607.13 FT TO TPOB TH S
 223.77 FT TH S 84 DEG 49 MIN 08 SEC W 455.22 FT TH S 84 DEG 49
 MIN 08 SEC W 6 FT M/L TO SH LN OF LAKE TH NWLY ALG SH LN TO PT
 S 89 DEG 53 MIN 04 SEC W FR TPOB TH N 89 DEG 53 MIN 04 SEC E
 TO TPOB & SH LDS ADJ

LAT: 47.604455 (47° 36' 16.04" N)
 LONG: -122.214563 (122° 12' 52.43" W)



AREA MAP/NO SCALE

PURPOSE: RESTORE AND ENHANCE
 BANK STABILIZATION

DATUM: C.O.E. 0.0' EST 1919

ADJACENT OWNERS:

- ① JAMES & PATRICIA VOELKER
 415 SHORELAND DR SE
 BELLEVUE, WA 98004
- ② WILLIAM WAHL
 700 SE SHORELAND DR
 BELLEVUE, WA 98004

PROJECT NAME: MYHRVOLD

REFERENCE #:

SITE LOCATION ADDRESS:

425 SHORELAND DR SE
 BELLEVUE, WA 98004

DWG#: 12-31008-A.1-1

PROPOSED:

REMOVE EXISTING TIMBER BULKHEAD &
 SOLDIER PILES. INSTALL NEW ROCK BULKHEAD
 AND COVERED BEACH W/ STEPS.

IN: LAKE WASHINGTON

NEAR: BELLEVUE

COUNTY: KING

STATE: WA

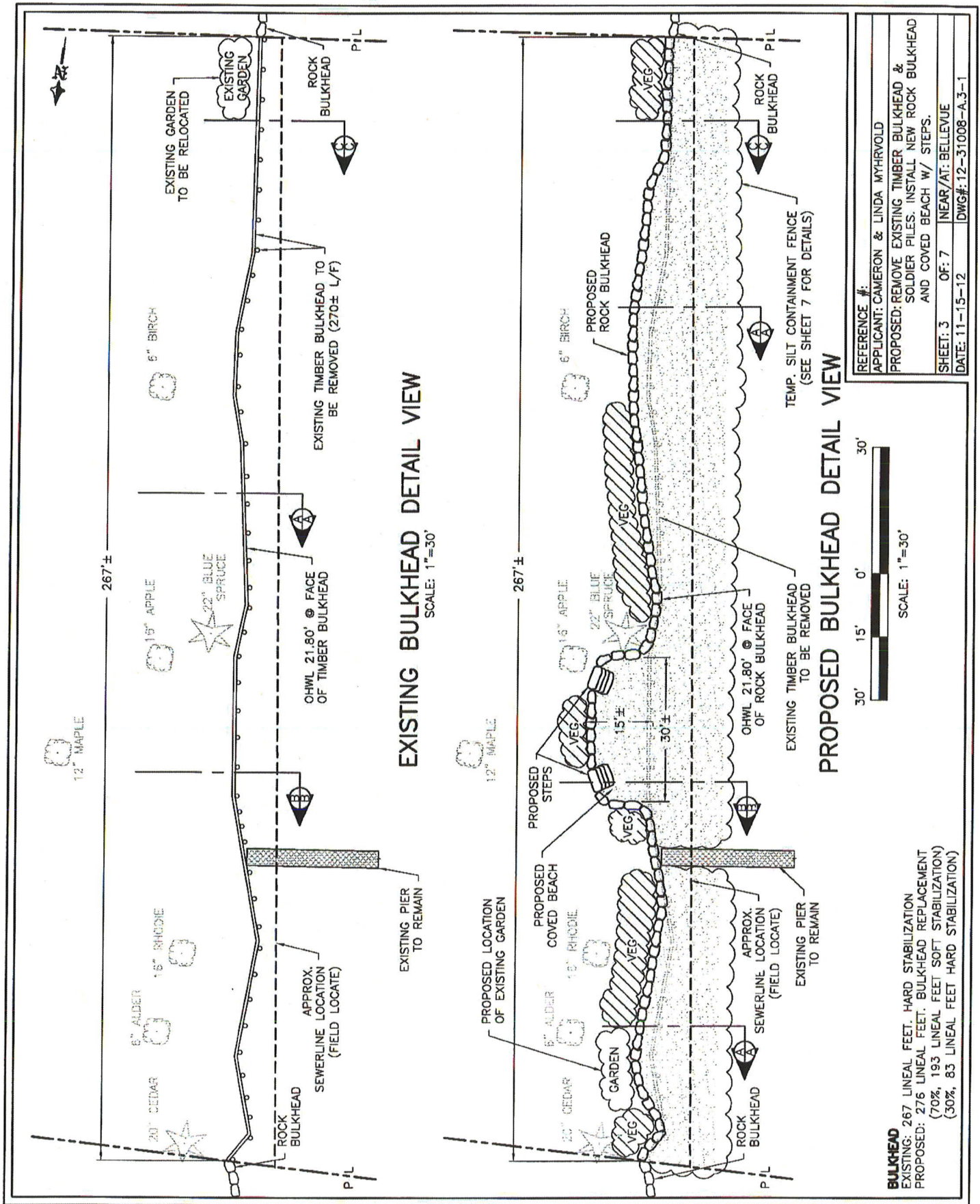
APPL BY: CAMERON & LINDA MYHRVOLD

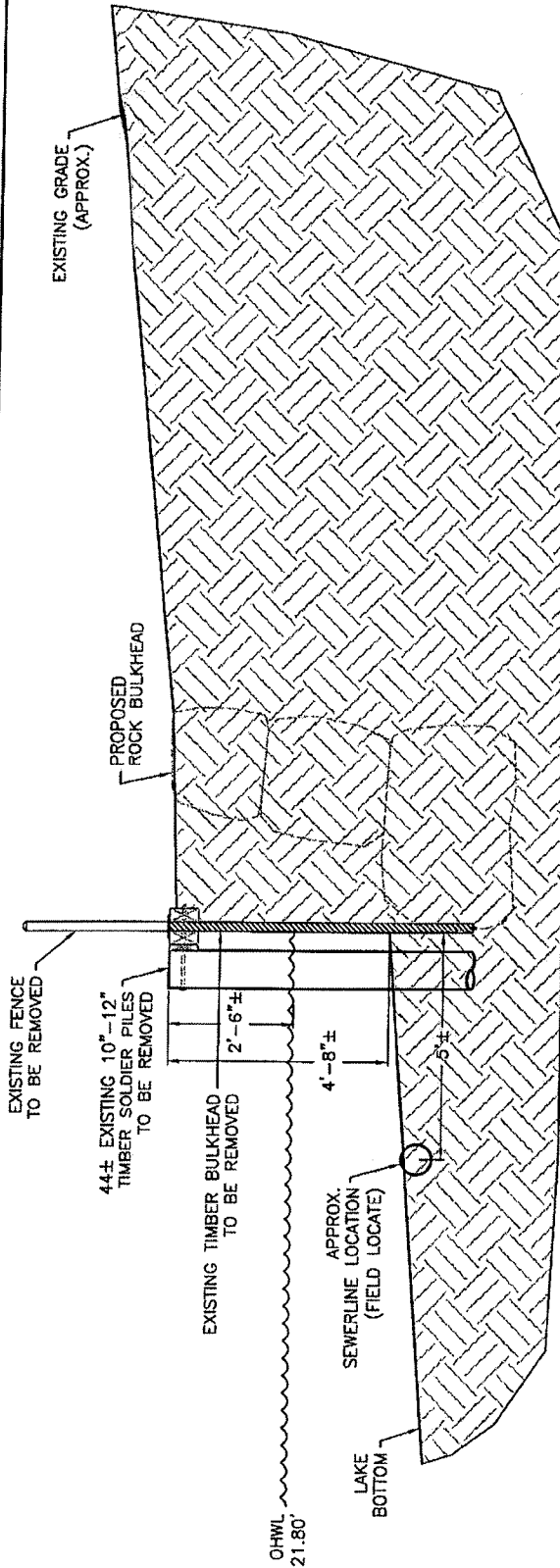
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OF: 7

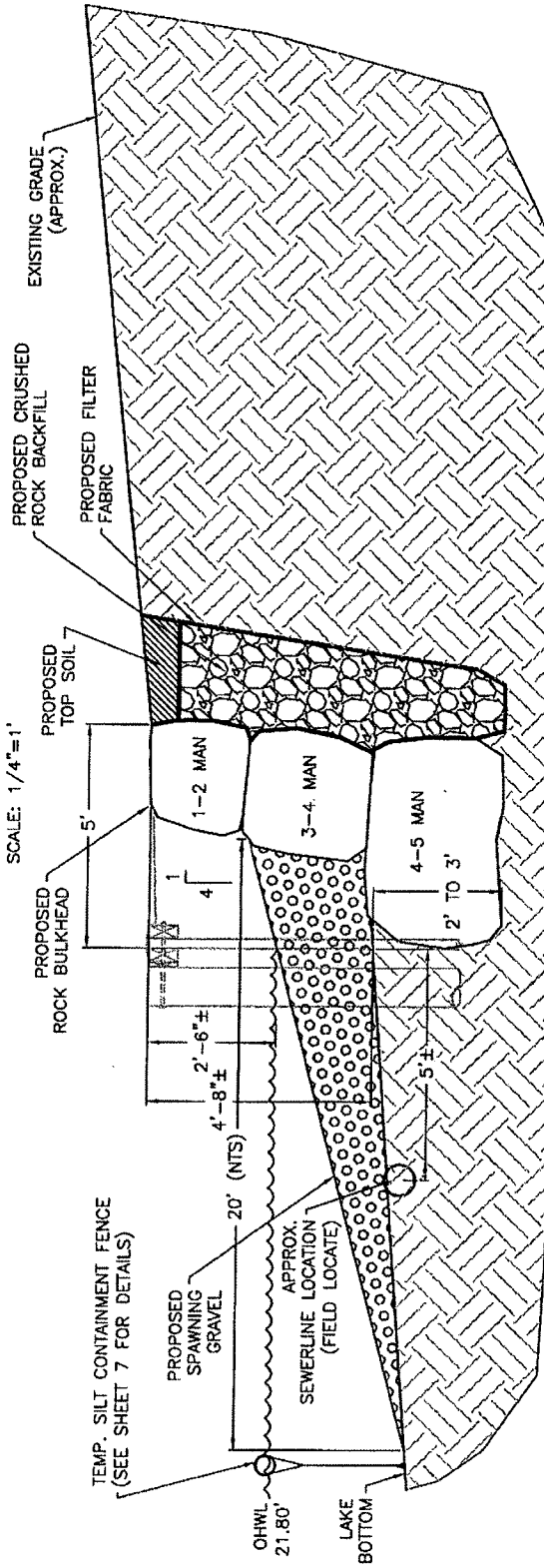
DATE: 11-15-12

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EXISTING SECTION A-A
 SCALE: 1/4"=1'



PROPOSED SECTION A-A
 SCALE: 1/4"=1'

FILL	
ROCK	300 C/Y
BACKFILL	160 C/Y
SOILS	17 C/Y
SPAWNING GRAVEL	260 C/Y
TOTAL=	737 C/Y

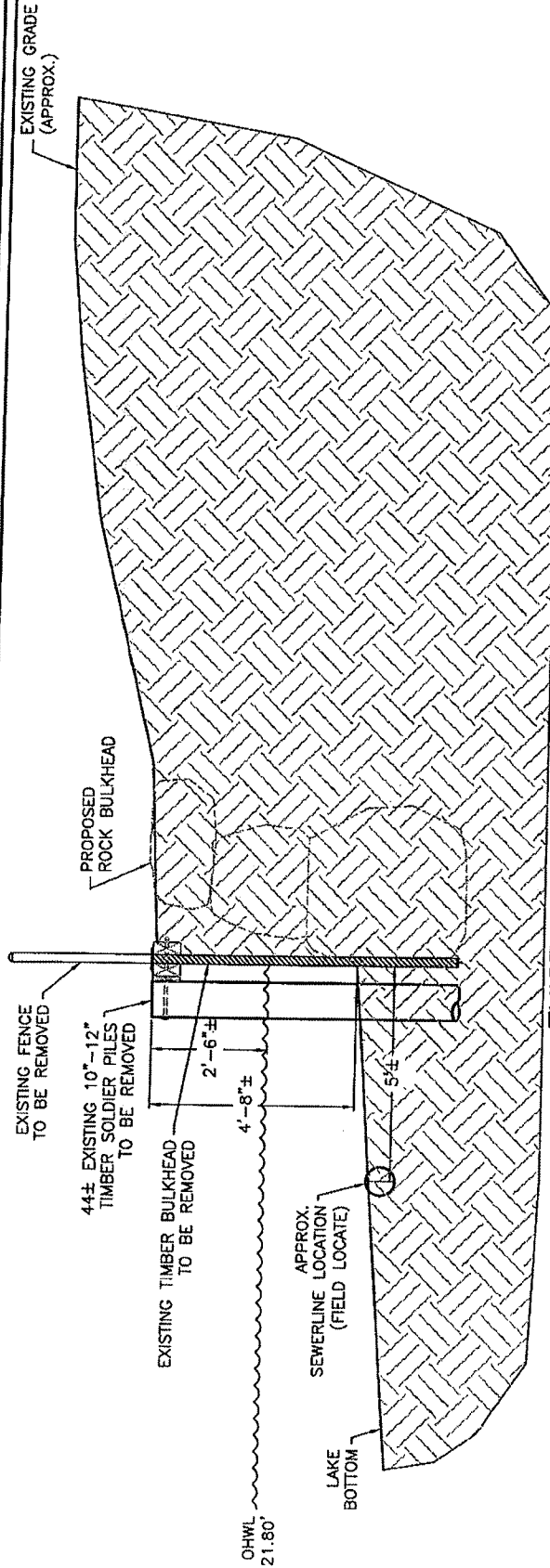
EXCAVATION	
TIMBER	98 C/Y
SOIL	379 C/Y
TOTAL=	477 C/Y

REFERENCE #:	APPLICANT: CAMERON & LINDA MYHRVOLD
SHEET: 4	OF: 7
DATE: 11-15-12	DWG #: 12-31008-A-4-1

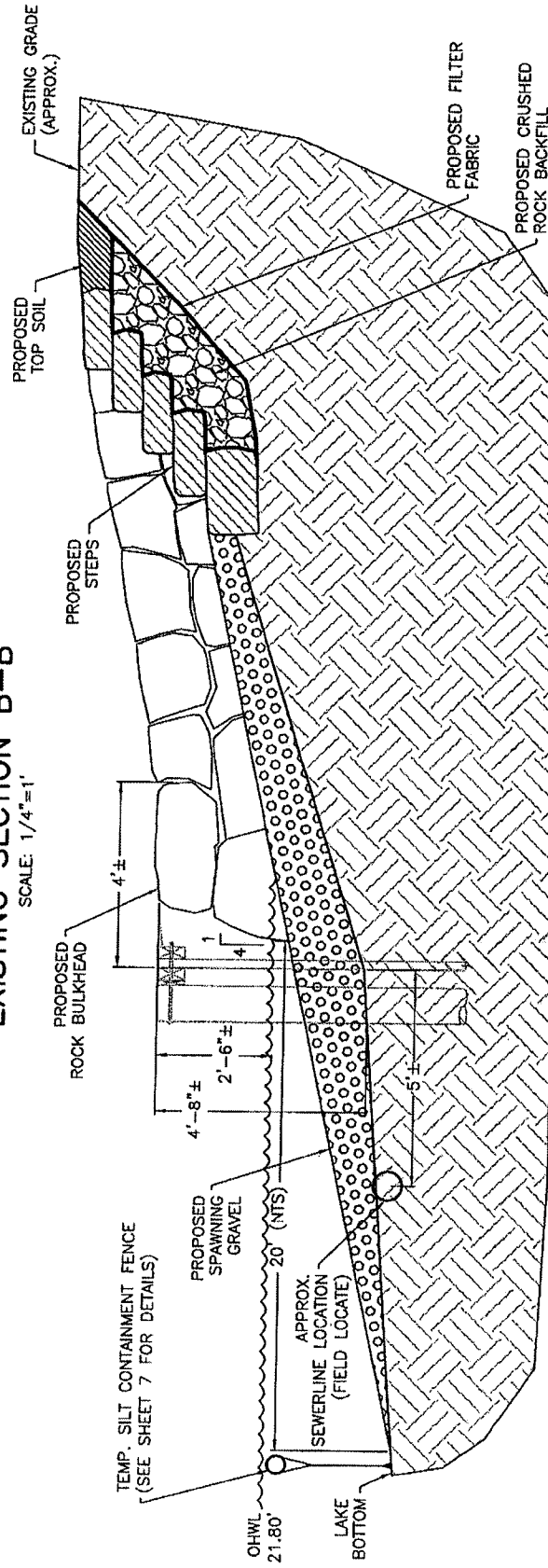
PROPOSED: REMOVE EXISTING TIMBER BULKHEAD & SOLDIER PILES. INSTALL NEW ROCK BULKHEAD AND COVERED BEACH W/ STEPS.

NEAR/AT: BELLEVUE

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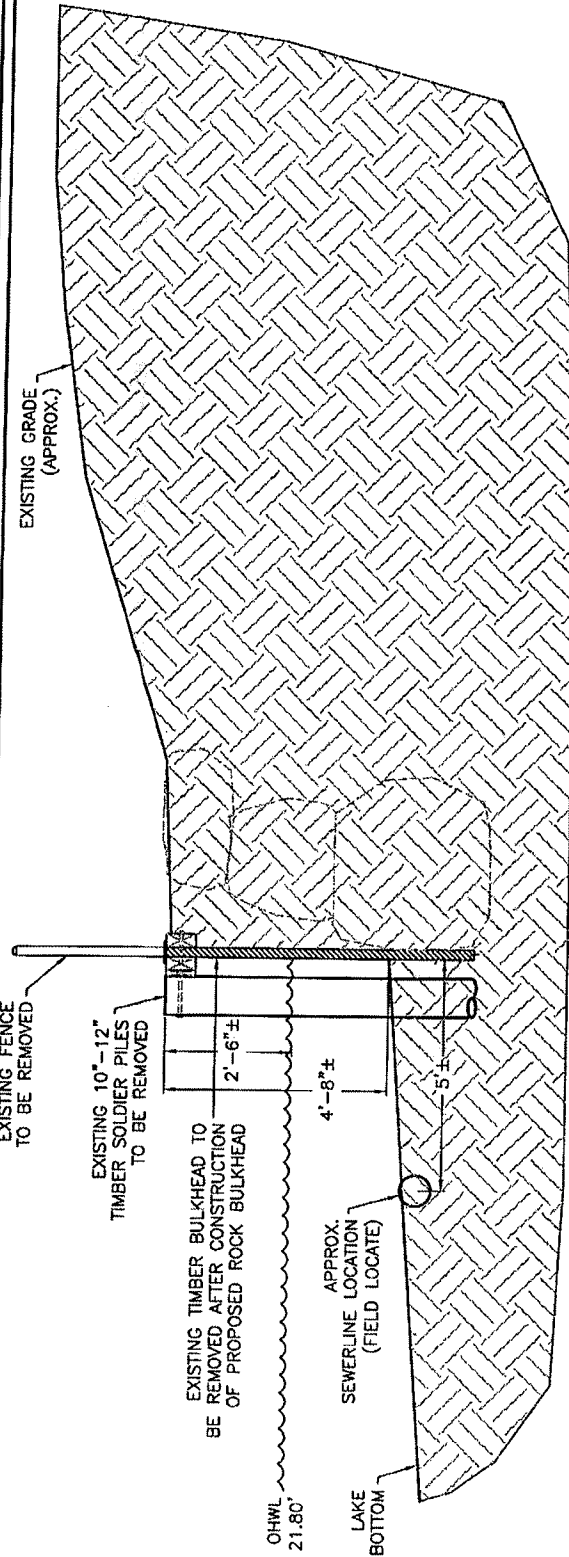
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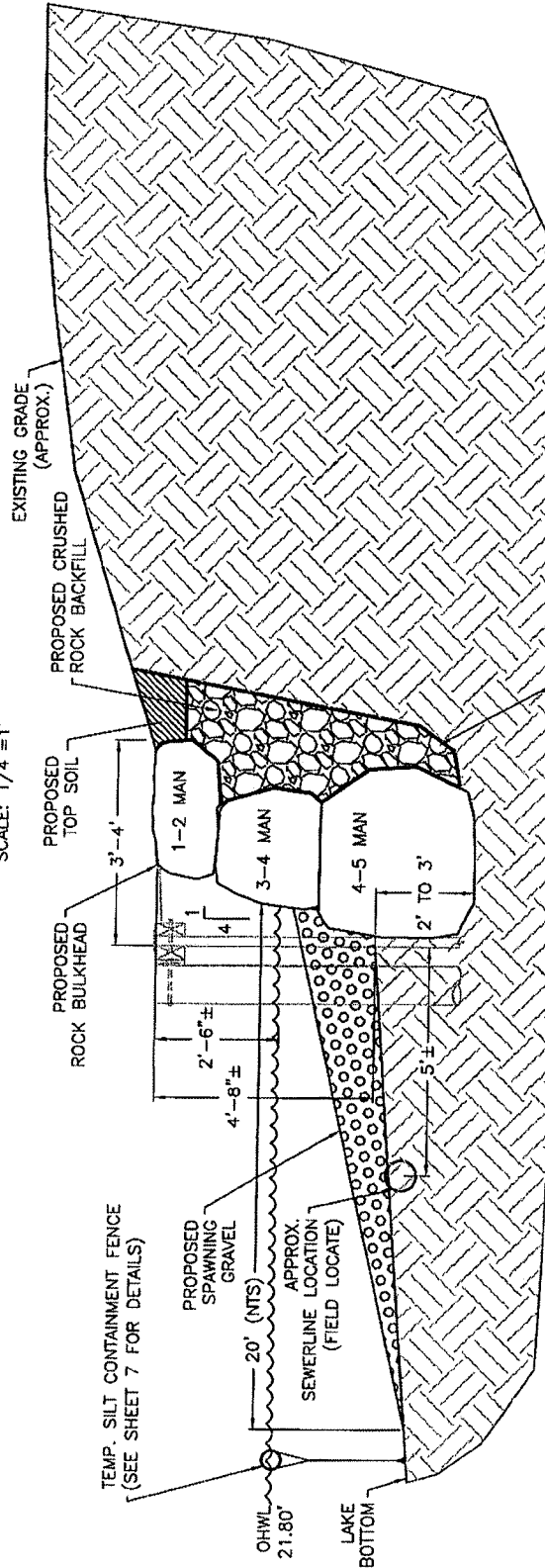
PROPOSED SECTION B-B
 SCALE: 1/4"=1'

EXCAVATION		FILL	
TIMBER	98 C/Y	ROCK	300 C/Y
SOIL	379 C/Y	BACKFILL	160 C/Y
TOTAL=	477 C/Y	SOILS	17 C/Y
		SPANNING GRAVEL	260 C/Y
		TOTAL=	737 C/Y

REFERENCE #:
 APPLICANT: CAMERON & LINDA MYHRVOLD
 PROPOSED: REMOVE EXISTING TIMBER BULKHEAD &
 SOLDIER PILES. INSTALL NEW ROCK BULKHEAD
 AND COVERED BEACH W/ STEPS.
 SHEET: 5 OF: 7 NEAR/AT: BELLEVUE
 DATE: 11-15-12 DWG#: 12-31008-A5-1



EXISTING SECTION C-C
 SCALE: 1/4"=1'



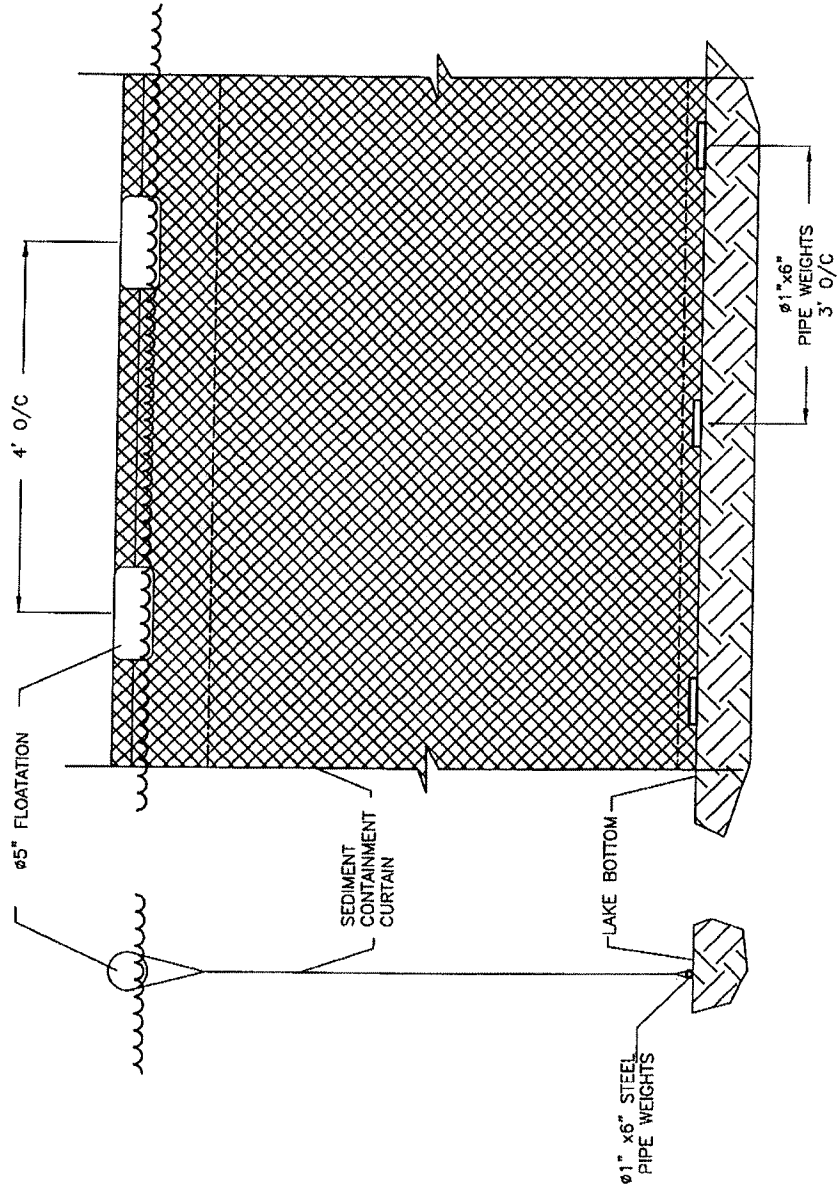
PROPOSED SECTION C-C
 SCALE: 1/4"=1'

EXCAVATION		FILL	
TIMBER	98 C/Y	ROCK	300 C/Y
SOIL	379 C/Y	BACKFILL	160 C/Y
		SOILS	17 C/Y
		SPAWNING GRAVEL	260 C/Y
		TOTAL =	737 C/Y

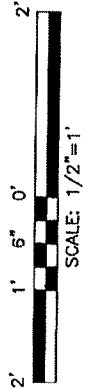
REFERENCE #:	APPLICANT: CAMERON & LINDA MYHRVOLD
SHEET: 6	OF: 7
DATE: 11-15-12	NEAR/AT: BELLEVUE
DWG#: 12-31008-A.6-1	

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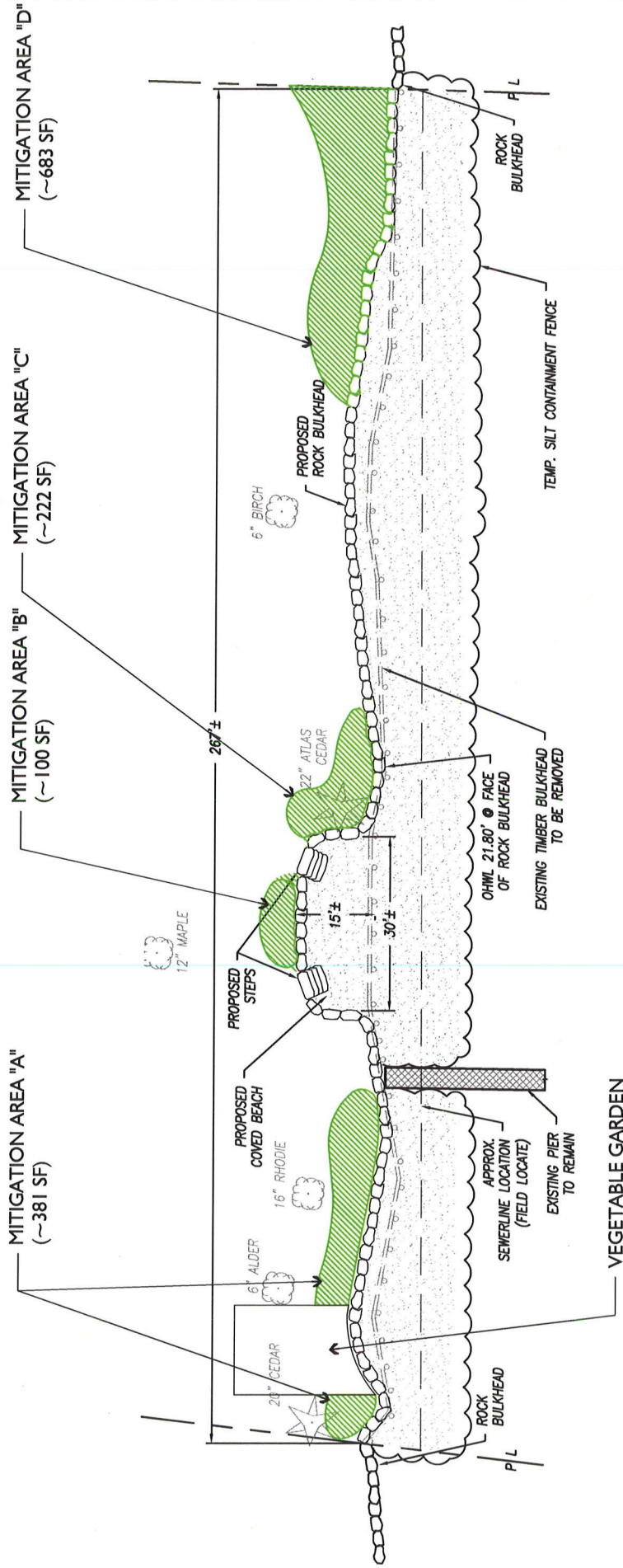
TEMP. FLOATING SILT CONTAINMENT FENCE



REFERENCE #:	
APPLICANT:	CAMERON & LINDA MYHRVOLD
PROPOSED:	REMOVE EXISTING TIMBER BULKHEAD & SOLDIER PILES. INSTALL NEW ROCK BULKHEAD AND COVERED BEACH W/ STEPS.
SHEET: 7	OF: 7
DATE: 11-15-12	NEAR/AT: BELLEVUE
	DWG#: 12-31008-A7-1

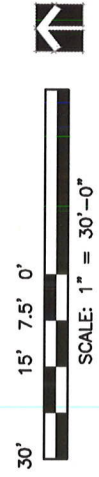
APPENDIX B

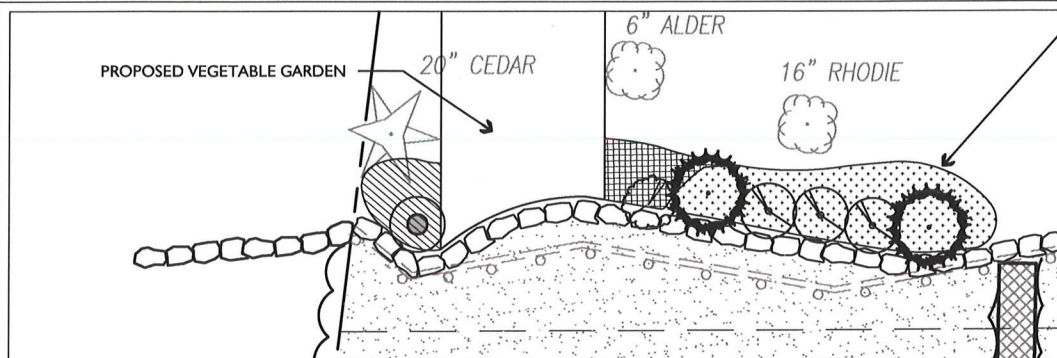
Mitigation Planting Plan



PLANTING DESIGN BY:
THE WATERSHED COMPANY
 750 Sixth Street South
 Kirkland WA 98033
 p 425.822.5242 f 425.827.8136
www.watershedco.com
 Science & Design

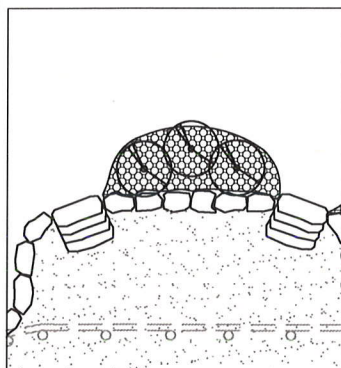
MITIGATION AREA LAYOUT



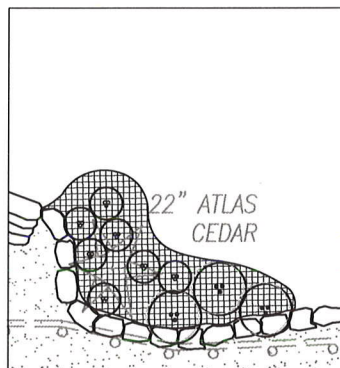


AREA CONTAINS EXISTING, MATURE VEGETATION. INSTALL NEW PLANTS IN AREAS DISTURBED BY CONSTRUCTION ONLY.

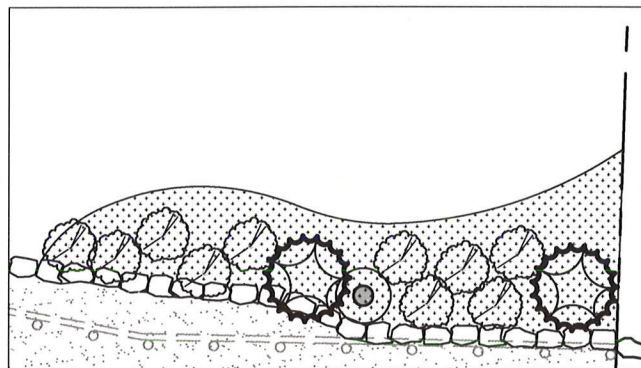
MITIGATION AREA "A"



MITIGATION AREA "B"



MITIGATION AREA "C"



MITIGATION AREA "D"

PLANT SCHEDULE

SYMBOL NAME SIZE QTY. REMARKS

TREES



PINUS CONTORTA
SHORE PINE

10 GAL.

2

FULL, WELL
BRANCHED

THUJA PLICATA
WESTERN RED CEDAR

10 GAL.

2

SHRUBS



ACER CIRCINATUM
VINE MAPLE

5 GAL.

3

MULTI-STEM,
WELL BRANCHED



CORNUS SERICEA
REDTWIG DOGWOOD

5 GAL.

11



HOLODISCUS DISCOLOR
OCEANSPRAY

5 GAL.

6



VACCINIUM OVATUM
EVERGREEN HUCKLEBERRY

5 GAL.

7



VIBURNUM EDULE
HIGHBUSH CRANBERRY

5 GAL.

2

GROUND COVER



ARCTOSTAPHYLOS UVA-URSI
KINNIKINNICK

1 GAL.

478

18" O.C. SPACING



ERIOPHYLLUM LANATUM
OREGON SUNSHINE

1 GAL.

28

24" O.C. SPACING



GAULTHERIA SHALLON
SALAL

1 GAL.

18

24" O.C. SPACING



POLYSTICHUM MUNITUM
SWORD FERN

1 GAL.

82

24" O.C. SPACING

PLANTING DESIGN BY:



750 Sixth Street South
Kirkland WA 98033

p 425.822.5242 f 425.827.8136

www.watershedco.com

Science & Design

PLANTING PLAN AND LEGEND

20' 10' 5' 0'



SCALE: 1" = 20'-0"



REFERENCE #:

APPLICANT: CAMERON & LINDA MYHRVOLD

PROPOSED: REMOVE EXISTING TIMBER BULKHEAD & SOLDIER PILES.
INSTALL NEW ROCK BULKHEAD AND COVERED BEACH W/
STEPS.

SHEET: 2

OF: 3

NEAR/AT: BELLEVUE, WA

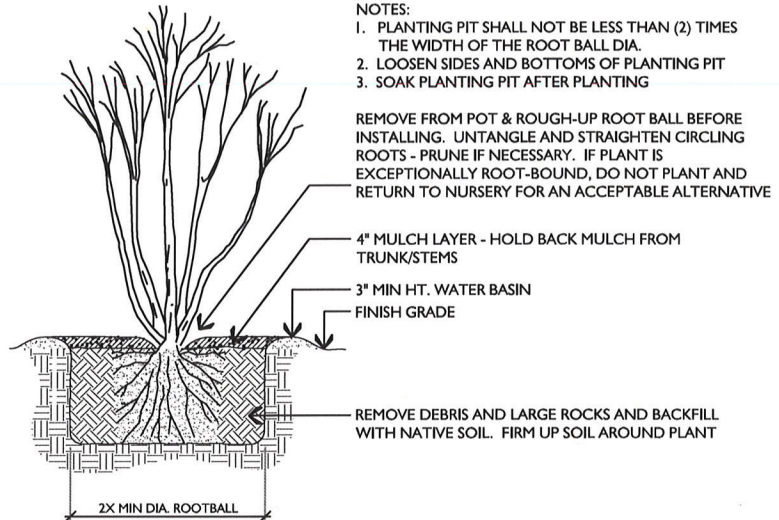
DATE: 11-30-12

DWG#: _

GENERAL PLANTING SEQUENCE:

1. Native plant installation shall occur during frost-free periods only. Preferred months for installation are between September 15th and April 15, prior to hot, dry weather. Plants may only be installed during hot weather if the applicant agrees to irrigation of the entire planting area, delivering at least 2" of water per week from June 1 through September 15th.
2. Procure plants in legend and insure that material meets the minimum requirements outlined in the plant legend and planting details.
3. Locate all existing utilities within the limit of work. The contractor is responsible for any utility damage as a result of the landscape construction.
4. Remove all invasive weeds within the project area.
5. Amend soils with compost as-needed. Typically this includes tilling in a 3" depth layer of compost.
6. Insure that no adverse drainage conditions exist that may affect proper plant growth and establishment.
7. Layout plant material per plan for inspection by the Landscape Architect. Plant substitutions will NOT be allowed without Agency approval.
8. Install plants per planting details.
9. Water each plant thoroughly to remove air pockets.
10. Install a 4" depth, coarse wood-chip mulch layer throughout entire project area. (This layer retains soil moisture and helps to prevent weeds from germinating.)
11. Install a temporary or permanent irrigation system capable of delivering 2" of water per week to the entire planted area. Maintain irrigation system in working condition for two (2) summers after initial plant installation.

The applicant shall maintain all plant material until final inspection and approval by agencies. If the owner or applicant chooses to hire a landscape contractor, then all plantings and workmanship shall be guaranteed for one year following final owner acceptance.



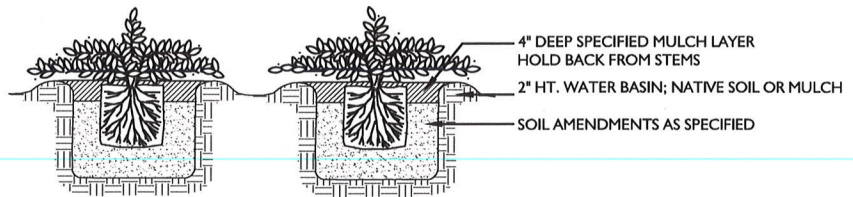
A

TREE & SHRUB PLANTING DETAIL

NTS

NOTES:

1. PLANT GROUNDCOVER AT SPECIFIED DISTANCE ON-CENTER (O.C.) USING TRIANGULAR SPACING, TYP.
2. LOOSEN SIDES AND BOTTOM OF PLANTING PIT AND REMOVE DEBRIS
3. LOOSEN ROOTBOUND PLANTS BEFORE INSTALLING
4. SOAK PIT BEFORE AND AFTER INSTALLING PLANT



B

GROUNDCOVER & PERENNIAL PLANTING DETAIL

NTS

PLANTING DESIGN BY:



750 Sixth Street South
Kirkland WA 98033

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Science & Design

NOTES AND DETAILS

REFERENCE #:

APPLICANT: CAMERON & LINDA MYHRVOLD

PROPOSED: REMOVE EXISTING TIMBER BULKHEAD & SOLDIER PILES.
INSTALL NEW ROCK BULKHEAD AND COVERED BEACH W/
STEPS.

SHEET: 3 OF: 3 NEAR/AT: BELLEVUE, WA

DATE: 11-30-12

DWG#: _

APPENDIX C

**Response to Nationwide Permit
Regional Conditions for Proposed
Stabilization**

**Re: Bank Stabilization Project
Myhrvold, Cameron and Linda
425 Shoreland Drive SE
Bellevue, WA 98004
Corps # NWS-2012-555**

Response to Nationwide Permit Regional Conditions for Proposed Stabilization
(provided by Waterfront Construction, Inc. and modified by The Watershed Company)
The proposed battered rock bulkhead application with coved beach area and full shoreline spawning gravel enhancement is site specific for this location and conditions. Specifics are outlined below:

- a. *Need for the work, including the cause of the erosion and the threat posed to structures, infrastructure, and/or public safety:*

The existing vertical wood bulkhead of deteriorating integrity, constructed with antiquated design support of no less than 44 10" and 12" diameter wood piles, extends the 267-foot frontage of the property. Its continuing failure threatens the narrow yard of the site, and particularly the existing trees overhanging the shoreline.

The proposed battered rock bulkhead will improve shoreline protection while reducing wave action effects from northerly, long-fetched seas and vessel wake damage of channeled, high-volume boat traffic. The design protects and extends life of the existing trees and their shoreline functions through the use of modern backfill and filter fabric materials associated with the battered bulkhead design.

- b. *Current and expected post-project sediment movement and deposition patterns in and near the project area: In tidal waters, describe the location and size of the nearest bluff sediment sources (feeder bluffs) to the project area and current and expected post-project nearshore drift patterns in the project area.*

The site's bulkhead is situated along the south lakeside of the entrance to Meydenbauer Bay, where north and northwest prevailing winds and subsequent wave action have impacted the lake's gravel substrate to where the City sewer line has been exposed. The proposed bank stabilization is needed to retain the existing shoreline property in the channeled area between East Mercer Island and Bellevue, south of Meydenbauer Bay. Adjacent and nearby area properties have existing bulkheads, which contribute to longshore sediment transport. The transport of sediment from the site erodes the protection ability of bulkhead base and limits potential spawning habitat. The proposed 260 CY of spawning gravel along the full face of the rock bulkhead will return the spawning area benefit and base rock protection for the site.

- c. *Current and expected post-project habitat conditions, including the presence of fish, wildlife and plant species, submerged aquatic vegetation, spawning habitat, and special aquatic sites (e.g., vegetated shallows, riffle and pool complexes, or mudflats) in the project area.*

The numerous trees and shrubs along the shoreline on the site provide shading, organic input, and cover to the nearshore. The proposed coved beach area has been designed to create an area of shallow-water habitat, preferred by juvenile Chinook salmon, that is non-existent under the current site conditions. Sockeye salmon are known to spawn along the shorelines of Lake Washington, and the enhancement of the shoreline area with spawning gravel and mitigation plantings will improve opportunities for fish and wildlife use.

d. [FOR rivers and streams] Assessment of the likely impact of the proposed work on upstream, downstream and cross-stream properties:

With the proposed activity on Lake Washington, there is no effect on rivers and streams with the proposed development.

**e. [FOR new bank stabilization activities in rivers and streams] Describe the type and length of existing bank stabilization within 300 feet up and downstream of the project area:
[IN tidal areas] Describe the type and length of existing bank stabilization within 300 feet along the shoreline on both sides of the project area:**

With the proposed activity on Lake Washington, there is no effect on rivers and streams with the proposed development.

f. Demonstration that the proposed project incorporates the least environmentally damaging practicable bank protection methods: If rock must be used due to site erosion conditions, explain how the bank stabilization structure incorporates elements beneficial to fish.

The proposed battered rock bulkhead and coved beach enhancement best protect the bank and enhance the shoreline. Our backfill design incorporates a filter fabric lining on both sides of the fill to retain soils and prevent wash out of soils. The design is non-imperious, allowing natural drainage through the rock bulkhead. The proposed placement of 260 CY of spawning gravel has a dual benefit in that it protects the toe and undercutting of the bulkhead base rocks, and re-establishes shallow water, nearshore habitat and potential spawning area. The proposed bulkhead is also setback approximately 2-3 feet along the majority of the shoreline length, reducing the waterward impacts of the bulkhead on habitat and sediment transport. Additional enhancements in the coved beach provide additional shallow water habitat and mitigation plantings will provide a source of prey and shade.

g. Planting plan using native riparian plant species:

In addition to the coved beach and spawning gravel components, 1,380 sf of shoreline will be planted with native trees, shrubs, and groundcovers, improving shoreline habitat functions.